

THE SMEAD SYSTEM

OF

DRY CLOSETS

IN THE

Cleveland High School Building.



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Columbo, O., May 10th, 1889.

To correct false impressions caused by the fierce, *unwarranted* and *malicious* attacks of the *Cleveland Leader* which have been continued for nearly four years, upon our system of warming, ventilation and closets, and which are exciting considerable comment and causing many inquiries from our friends and customers throughout the country, is the especial object of the publication of this history of the entire situation from commencement to date. The following is what the writer *would have said* at a recent meeting of the Cleveland Board could he have had the opportunity to do so. This opportunity was denied, as were also *any remarks* upon the subject by *any of the large number of prominent citizens of Cleveland* who were present at the time and who desired to be heard *in defense of the truth*:

MR. CHAIRMAN, GENTLEMEN OF THE BOARD AND CITIZENS OF CLEVELAND: For more than twenty years I have been actively engaged in the business of inventing, manufacturing and selling warming and ventilating apparatus and as a result am to-day the most extensive manufacturer in this line in America. I mention this fact to call to your attention to the *possibility* that *I may know a little more about the subject* than parties engaged in other lines, and possibly more than those engaged in the publication of sensational articles in the *Cleveland Leader* or *Penny Press*.

I am not here this evening, however, to advertise my business or to attack the press of your city. It is useless to do the *latter*, for *they* have the *larger audience*. The business which should engage our serious attention this evening is to devise some plan whereby the *senseless panic created by a lying press* may be stopped and the dangers incident thereto be averted, for I wish to assure you most positively that I am more anxious to quiet the groundless fears of the people who have been frightened than I am to protect personal or commercial interests, and to this end I will as briefly as is possible lay before you the exact situation. I have nothing to hope for from the press, and aside from the harm it has done to others I am indifferent as to what it may say.

For many years thousands and thousands of dollars were squandered in attempts to warm and ventilate your public school buildings. About two years ago, after experimenting a year with my apparatus in an old building, your Board of Education contracted to introduce complete apparatus in several new buildings. At once the *Leader*, in an editorial, condemned your action and made many statements concerning the heating apparatus that were untrue. We asked for a reporter to interview the teachers in the buildings, also teachers in the West Cleveland building and two trustees of Hiram College, residents of your city, Messrs. Teachout and Bowler. *The report contradicted every statement made by the editor* and he charged me 50 cents a line to publish it. Since then I have had but little confidence in *that portion* of the "great American press."

The successful operation of the heating and ventilating apparatus in the school buildings erected two years ago could not be well denied, and because of the success of the system of closets introduced in connection therewith and the horrible condition of the water closets in your high school building and in the Rockwell building your board introduced the closet system (*only the closets*) in those two buildings.

Now, what is the Smead system of dry closets? Simply the application of natural laws in the construction of closets, whereby natural instead of artificial means are employed to destroy and render harmless the offal of the human system. Five-sixths of all human deposit is water. The Smead system takes away the water and leaves in the brick and iron vault the other one-sixth, dry and hard, ready to burn like shavings by application of a lighted match, as was demonstrated in the presence of fifty of your citizens at the High School Saturday. "The closet apartments are more free from odor than a well kept pantry or parlor." One gentleman, after examination, said: "I confess that these results create in my mind a deep and profound impression. Here is a system of closets sufficient to accommodate hundreds of pupils, in constant use for eight months, at limited cost, in perfect condition, with no noisome odors; no unsightliness; no pipes; no waterworks; no plumbers' appliances; no sewerage system; no loathsome and disease creating cesspools; no stifling disinfectants; nothing but a free and unobstructed circulation of God's atmosphere."

The remarkable success of the dry closet system since its first introduction has been exceeded by but few inventions. The first set was erected in Toledo five years ago; *since that time they have been introduced in over twenty public school buildings there—both outside and inside closets have been abandoned and mine substituted.* Last summer an elegant stone and brick building, four stories high, costing over \$3,000, was taken down and my system built into the basement. One reason why this was done was because of a petition presented to Board of Education signed by every property holder on that street.

As before stated, there are over twenty school buildings in Toledo containing the dry closet system. Have you heard of any epidemic there? No; nor will you hear of any. Toledo papers are not noted for efforts to create a sensation and to date seem to prefer the truth to error.

Three years ago the system was first introduced in one school building in Washington, D. C. Two years ago in eleven more. Elaborate and expensive systems of water closets (the most expensive I have ever seen) were removed from four buildings as large as yours, and mine substituted. Their operation was so satisfactory that last year, 1888, they contracted with me for nine more buildings, and inside of the next three months will introduce them in six more, making twenty-seven school buildings with the closets and thirty-eight with heating and ventilating apparatus. Have you heard of any officer-elect or any office seeker who has hesitated to go to Washington during the last three years because of the use there of the Smead system of dry closets?

There are no more beautiful homes in Cleveland than in Toledo and Washington, and people there value their lives as much as they do in Cleveland. There is no city in America with a better opportunity to dispose of sewage than the city of Detroit. People's lives are of as much value there as here. When the system had been introduced in five school buildings in that city, much against the wishes of the steam heating apparatus manufacturers, a Detroit paper, aided by plumbers and their allies, commenced a crusade against us, compared with which the efforts of the Cleveland *Leader* are as mild as a summer morning. I was caricatured, ridiculed and assailed with more ability than to date the *Leader* has given evidence of. I was there, as here, called a bribe giver and the board bribe takers. The board appointed a committee of several doctors. As soon as they made their report contract was awarded me to furnish heating and ventilating apparatus for seven more buildings, and after two years' use the board are going to introduce it in five more buildings.

The ignorant (?) doctors who compose the faculty of the Detroit College of Medicine and who are now erecting one of the finest college buildings in the United States are also introducing the same system and apparatus that the *Leader* calls a "death trap" and all other hard names it

can think of and because of lies published by the *Leader* the people, knowing little or nothing about the true condition of affairs, have been blindly led into a condition of mind serious at the present time and liable to be more so if something is not done to turn them in the right direction.

I will not take your time to call attention to the use of these closets in more than 100 cities other than those named. In the manufacture of heating apparatus *I am opposed by other manufacturers, and especially by manufacturers of steam heating apparatus*; in the introduction of the closet system by the plumbers, and these combined make life somewhat of a burden to me. A result of their action, aided by the press and the natural inclination of the people to cry "stop thief" if the cry is once started, has caused the excitement here and great damage to my business. An error was made when the closets were first erected. This error was corrected by me and at my expense, *and from that day to this there has been no more perfect system of closets on earth than in your High School building. No man, woman or child living in Cleveland or elsewhere has ever smelled an odor from those closets or those two ventilating stacks.* The building never had any ventilation, and the architect who built it ten years ago holds a written document from the Board releasing him from all responsibility for the system that was introduced. It never was ventilated until I introduced the closets, and from that day to this *those two ventilating flues have drawn from the basement over 600,000 cubic feet per hour*, and most of the time the air drawn from the basement has come from the rooms above it.

When I first suggested the system of closet construction I was told it "would not dry the deposits." It did do it. Myself and customers were then cautioned against "back drafts." The back drafts did not come. They then said we secured all our contracts by improper means. "Boodle, boodle, dear boodle," was their cry, until someone said the air of the neighborhood was being poisoned and that people were dying like sheep in the desert, and a return to the water carriage system would correct the trouble. In other words, *if you will dump the filth into the water you drink and breathe the gases that come to you through city sewers ventilated into your streets*, you will be more healthy, contented and happy than if only the gases from the closets are discharged a hundred feet in the air and so disseminated that only one part in 10,000,000 parts can be discovered. And when you consider the small space occupied by man as compared with all space you can multiply by 100,000,000 more. The figures I give you are correct.

The first iron plow was invented in 1797, and it was rejected by the New Jersey farmers *because it poisoned the soil.* The people of England said the use of the railroad train would render horses of no value and so shake the country that eggs would not hatch. Notwithstanding the above statements a large number of plows are used, horses command a high price and spring chickens are always on the market.

Now, if you wish to return to the water carriage system you can do so. It is only a question of a short time when you will return to the dry closet. I have no fear of this. If you erect closets in the yard the citizens will complain worse than they do now, and with a just reason for complaint.

If, to meet the public demand, whether it be senseless or not, you wish to go back to the water system, I would suggest that you avoid complaint from immediate neighbors and the large expense incident to outside construction, by constructing in the vault you now have, long troughs suspended directly under the seats. Fill these with water and as often as you may direct, the janitor can pull a plug and discharge the contents of the water pan into the sewer. All odors arising from the vaults will be taken off through the ventilating stacks.

Complaint is made that the school rooms are not ventilated. With them I have never had anything to do. They can easily be ventilated by following the plan I suggested last fall. You can connect your present vaults with the sewer and secure "water carriage" and thorough ventilation of closets for \$200 to \$250. For about an equal amount you can ventilate to the extent your steam heating apparatus will admit, one-half the school rooms. If you will build the other two

stacks as high as the highest part of the roof, and properly connect them with the other rooms, you can ventilate the other half of the building. The two stacks referred to are now twenty-one feet below the highest point of the roof, and so were the other two until closets were introduced.

I will close by repeating what I have said once before, namely, *no man, woman or child ever smelled an odor that came from the top of the two stacks with which the closets are connected.* The germ theory scare will soon die and its originator should be buried alongside the originator of the poisoning-of-the-earth-by-the-iron-plow theory.

DR. HERRICK INDORSES THE SMEAD SYSTEM.

Dr. H. J. Herrick, Professor of Hygiene in the Cleveland Medical College, was one of the number who would have spoken upon the subject, and learning that on Saturday he visited the Central High School building and made an examination of the Smead closet system in operation there, a *Plain Dealer* representative interviewed him with respect to his views of that system, as follows:

Reporter: "I wish, doctor, you would state somewhat in detail your opinion of the so-called Smead system of dry-closets, as now in use in the Central High School building."

Dr. Herrick: "I made an examination of the closets in the Central High School building on yesterday. I had heard much of them before and had known of the theoretical principles involved in the system, but never had personally examined it. I think that system is based on approved scientific principles, and the method of disposal of offal I regard as far superior to any water-closet method of disposal that I have ever known, being less objectionable on account of offensive odors, and more free from danger of disease. The dropping of excrement into an isolated vault at interrupted intervals, immediately made dry by a current of warm air, absolutely prevents any fermentative or putrefactive changes in the contents and obviates any theoretical danger of poisonous emanations from the material. Noxious gases are supposed to be produced by decomposition, and it is a theory, not universally accepted as true, that in that decomposition germs are produced which are, in some indefinable way, the causes of disease. That, however, is a theory and a theory only. But suppose that theory to be true, it involves for the development of germs an element not present in the Smead system. For the purpose of decomposition there must be organic matter, heat and continued moisture; but in the Smead system there is an absence of continued moisture and therefore a lack of one of the conditions necessary for the generation of the so called germs of disease. But it is claimed that the gases are carried out through the high stack or flue and dissipated in the surrounding community. It is to be borne in mind, however, that the effluvia from the excrement is gradual, from day to day, and insignificant as compared to the noxious effluvia from a thousand sources of decomposition around our homes.

"The capacity of the atmosphere for the disposal of noxious gases is illimitable. The disposition of noxious gases is so rapid, and wisely so, that when any poisonous matter has been carried into the air, especially at the height of the stacks of the High School building—even conceding the emanations through those stacks to be of the most noxious kind—the disposition is so rapid and extensive as to prevent the possibility of any infection from that source to the neighborhood around. I have no doubt the pernicious effects upon the neighborhood of emanations from a manure pile, the offal of not more than two or three horses, would be many times greater.

"I would regard it as a calamity to have the Smead system removed and the old system of water-closets entering the sewer substituted—a calamity to the health of the occupants of the building and to the health of the people of the community around about. I would regard an arrangement for the disposal of offal in an annex, connecting with the sewer, as involving much more danger to the community from unwholesome odors and noxious gases than the present system. I speak now only of the method for the disposal of excreta and not with reference to the ventilating conditions of the building, which may be defective from lack of minor appliances. I have no interest in the Smead system but have a very great interest in the school.

"My son is in the High School in the second year of his course. He was sick four or five days during the present term with manifest derangement of the system, attributable in no sense to any lack of ventilation or to bad air but from disturbances of the digestive organs. I have had cases of sickness in the vicinity of the High School building during the past six months, but in no case am I able to attribute the diseased conditions manifested to any noxious emanations from the High School building. It is difficult, as all must know, to specifically fix upon any one factor as the cause of disease, as, from experience, reading and theory we would not expect usually that any one cause was to be regarded as the immediate factor in producing disease, but a combination of causes usually prevails. We may say generally that any factor which impairs or tends to impair the function of respiration would be a significant cause of disease. Respiration involves the complex process of the elimination of effete material from the lungs and the skin at the same time that the oxygen of the air is imparted to the blood. Now, if the noxious material exists, either in the form of carbonic acid gas or ammonia or nitric acid in undue proportions, the noxious gases mentioned would be liable to impair respiration to the degree of their unusual presence. It is to be borne in mind that they are always present in a larger or smaller degree.

"I was at the building yesterday during the process of burning out of the residue of fecal matter which had accumulated, as I learn, since last September. The draft was at the time unusually strong, caused by the burning. The dryness of the fecal accumulations, as I saw them, would absolutely preclude any of the fermentative changes which I speak of as essential for the emanation of noxious gases."

Reporter: "It is said that that very fact demonstrates that the system is dangerous, because there is so little left and it is so odorless, that all noxious vapors must have been thrown off to the injury of the community."

Dr. Herrick. "As I have already indicated, the drying out process has prevented the fermentative or putrefactive changes which would induce the generation of noxious gases in the air."

Reporter: "It is said again that it is vastly better to pass the excreta through sewers into the lake because the water has such enormous power to absorb the mephitic gases and other noxious vapors."

Dr. Herrick: "The relative capacity of air and water for destroying noxious elements and for purifying might be a matter of some question. The atmosphere has, to my mind, a very much greater capacity for destroying and diffusing the noxious germs or noxious gases than the water. According to authoritative statements sewer water has a capacity for discharging an almost illimitable amount of noxious vapor wherever it is found. Dr. Letheby found that sewage water excluded from air and containing 128 grains of organic matter per gallon yielded one and two-tenths cubic inches of gas per hour during a period of nine weeks. The peculiar fetid smell of sewage gas is owing to the presence of organic matter whose exact chemical composition has not been determined. It is believed by some to be carbo-ammoniacal. According to Dr. Cunningham it contains distinct bacteria and other low forms of cell life. Now, water has a capacity, especially running water, for purifying itself. It is claimed, as I remember it, that a distance in rivers of twenty miles is sufficient to render running water comparatively pure from sewers entering the river above. I am not certain as to the distance, but this is a fair estimate. The methods by which water is purified are

by animals or plants in the water, by the action of oxygen upon the organic matter, that is, aeration, by the diffusion of the noxious material and by sedimentation. The methods of purifying the atmosphere from its noxious gases and elements are: By the rapid diffusion of the gases in the atmosphere, by the action of oxygen which is always ready to consume—especially where there is any amount of ozone it is active for the destruction of organic matter—and, coincident, is the action of vegetable life, which rapidly consumes by an appropriation of carbonic acid gases and, it is supposed, also of mephitic gases. These are the natural methods by which the atmosphere is kept free from gases or conditions unfavorable to animal life.”

Reporter: “It is charged that in obedience to some law the gases and the vapors escaping from the ventilating stack fall to the ground and permeate the dwellings in the neighborhood.”

Dr. Herrick: “According to a well known law the diffusion of gases is in a still atmosphere proportioned to the square of the distance. Currents of air, winds, vastly increase the rapidity of the diffusion. Gases discharged into the atmosphere the height of the High School stacks are very rapidly diffused. Bear in mind that the contents of those closet vaults are comparatively small. There are perhaps 500 evaenations in each twenty-four hours. It must be seen that the vapors from these contents are very rapidly diffused and that they are not a perceptible factor for rendering the atmosphere impure. They are not to be mentioned in comparison with all the accompaniments of the ordinary household and stable. I say this with all deliberation that the placing of an annex in the High School grounds with vaults connected with a sewer would be more pernicious in its effect upon the neighborhood around than the present system.”

Reporter: “How would it do to place water closets in the building?”

Dr. Herrick: “Placing water closets in the building would be even more objectionable, as proven by the experience already had.”

Reporter: “Does the diffusion of gases and noxious vapors render them harmless?”

Dr. Herrick: “Most certainly. The intensified impurity existing at the point of emanation from the stack, as it passes into the air, is rapidly diffused. The proportion of carbonic acid gas, doubtless excessive in the stack, is quickly reduced on emanation from the stack and diffusion through the atmosphere to the amount ordinarily found. The proportion of this gas is taken as an approximate measure of all impurities in the air. The estimates of the relative amount of this gas in air deemed pure for respiration varies from three-tenths to five-tenths per 1,000, or 3-100 to 5-100 per cent. About an ordinary dung pile the amount would be very largely increased, and about a closet where this gas is discharged.”

Reporter: “What is your idea as to an unusual prevalence of disease in that locality during the past few months?”

Dr. Herrick: “I have not discovered any unusual prevalence of disease in that vicinity.”

Reporter: “Why would you consider a water closet in an annex or detached building more harmful than the present system?”

Dr. Herrick: “From the fact that there is always with a water closet more or less scattering or spreading of urine and fecal matter which are constantly discharging gases. In urinals you are almost sure to have an offensive odor derivable from them and quite as offensive and unwholesome as the gases from decomposing fecal matter. The imperfection also of traps, which all recognize, in sewer connections render the dangers from that source quite as appreciable as from any other source. I mean to say that the defects from traps render the liability to danger quite as great as from anything that can be detected in the present system.”

Reporter: “Is not the fundamental difference between the water closet and Smead systems that the former seeks to confine all gases and to send everything through sewers to the lake to be there purified, while by the latter the immediate diffusion of the gases into the upper air is sought? If so, which do you deem the better system?”

Dr. Herrick : "The Smead system I should say is designed to prevent putrefactive changes in the matter and to dispel the gases that arise, into the air, in the natural way. Conceive of the emanations of this city of 250,000 people passing into the air and with them the emanations from the vast number of animals of all kinds here and from their excreta ! How inappreciable in comparison are the emanations from the 1,000 pupils of the High School, which through a beneficent plan of the diffusion of gases by and through the atmosphere are rendered harmless. Contrast then the accumulations of organic matter in water, whether standing or running, which are much more liable to discharge noxious gas into the air in pent up places, while they should be afforded the most free diffusion. I have no doubt that the dangers are very much greater with a system of confining in sewers than with this method. I am so impressed with it that I should much prefer to have a system of that kind in my house than any system of water closets I now have and I have the best that could be obtained at the time. I give this as my free will opinion in the interests of the public health and of sanitary science."

A COMPLETE STATEMENT OF THE SITUATION.

With the preceding as a preface, I will now, and as briefly as possible, make a complete and full statement of the entire situation, paying as little attention as possible to the *Cleveland Leader* :

Three years ago three gentlemen came into my office in Toledo, about 11 o'clock A. M., introducing themselves as a committee appointed by the Cleveland Board of Education and authorized to purchase heating and ventilating apparatus for the school building known as the Eagle Street School. Concerning their visit here the *Leader*, in an editorial yesterday, says as follows:

"There is a moral to the tale that practically closed in the Board on Monday, and it should not be lost sight of. The introduction of the Smead system into the schools of this city was conceived in iniquity and born in sin. The first contract, for the heating and ventilating apparatus, without the closets, in the Eagle street building, was the result of jobbery and corruption. Members and officers of the Board were taken to Toledo to investigate the system. They were wined and dined, taken to disreputable places, and most hospitably treated after the fashion prevailing among lobbyists and corruptionists, and it did not cost them a cent. The performance was the most disgraceful ever recorded of the most disgraceful Board of Education the city ever had. It is well that a system thus introduced in the schools should be ignominiously expelled."

In view of the fact that *every statement made in the above quotation from the Leader is a lie, pure and simple*, it is well that they talk about "morals." The lying writer had better talk about his *own morals* and to *his priest* rather than about general morals *to the public*. The actual facts are that before noon these gentlemen were taken to a school building, which they carefully examined. After dinner, at the Boody House, they examined two or three more buildings, "beat us down" a little on our price and returned to Cleveland on a 5 P. M. train. I cannot now, without examination of papers in the vault, recall their names, as I have not seen one of them from the hour they entered a carriage at my office door some three years ago. *Nineteen out of every twenty statements that have been printed* in the paper referred to during the past three years are as false as the one quoted above.

I was interviewed upon the subject by the Toledo *Blade* and the following was true then and is true now :

"What is the matter with the Smead system in the Cleveland school building?" asked a *Blade* reporter of Hon. Isaac D. Smead, whom he found in his new office building on Huron street.

"Nothing now."

"What has been the trouble there?"

"There has been no trouble with the Smead system of heating, but in one building there was a serious defect in the application of my system of dry closets. I suppose you have been reading the Cleveland *Leader*," replied Mr. Smead, with a smile.

"Yes, and the *Blade* would like to know the facts in the matter."

"Then I will have to tell them, for you cannot get them from the *Leader*, if I can judge by what they have printed."

"Have you done much work in Cleveland?"

"Yes, both for the Board of Education and in other public buildings. Briefly, the facts are these: Several years ago the Cleveland Board of Education wasted a very large sum of money in heating apparatus, having a large number of fine buildings. One morning, two years ago last summer, three gentlemen came into my office and were introduced as a committee from the Cleveland board to investigate my apparatus for school buildings. After examining into the matter with what seemed to be more than ordinary care, they contracted with me to furnish apparatus for the Eagle Street School building, and returned home on the afternoon train. The apparatus was used during the winter of '86-'87. During the spring of 1887, while in Washington city, my attention was called to an attack upon me and my apparatus, published in the Cleveland *Leader*. I went down to the newspaper offices, and by examination of the Cleveland papers learned for the first time that at a meeting of the Cleveland Board of Education the Building Committee had been instructed to introduce the Smead system into all of the new buildings, some five or six in number. Our contract amounted to some \$25,000. I was fairly entitled to the contract, because of the successful and satisfactory operation of my apparatus in the Eagle street building, and also in the West Cleveland School building. Of course I was pleased at the action of the board, but I was also being injured by the *Leader* articles."

"What did you do?"

"I finished my business in Washington, came home and asked the *Leader* to send a reporter to interview all the teachers in the Eagle Street building (nine in number). This it did, and also interviewed the members of the West Cleveland Board, and Mr. Teachout, chairman of the building committee of Hiram College, who resides in Cleveland. I have since published the interviews among my testimonials. Every statement made was contrary to those which the *Leader* has been publishing. They printed the interviews and charged me 50 cents for every line printed."

"Did you pay the bill?"

"Of course I did. A man is very foolish to quarrel with an editor if it can be prevented. The advantage is all on his side; and the poor contractor is the legitimate prey of the newspaper man."

"How do you know?"

"Twenty years of experience teaches a fellow some things he don't soon forget."

"As a newspaper man I cannot agree with you; but what about the recent trouble?"

"Just this: The work done in 1887 was entirely satisfactory to every one except disappointed competitors and their friends; and the board again contracted with me to furnish apparatus for two more buildings. One of these—the High School building—was erected a good many years ago. It contained a steam heating apparatus and four large ventilating stacks. In these stacks there were steam coils and pipes designed to keep the stacks hot and make them 'draw,' notwithstanding the fact that the stacks were twenty one feet lower than the highest portion of the

roof. Although we were assured that 'there had never been any down draughts,' we hesitated about connecting the closets with them; but my superintendent finally did so, although against the protest of my engineer. The system operated successfully until some three weeks ago, at which time there was a severe wind storm in Cleveland, and the wind struck the roof in such a manner as to glance off and go down the ventilating flue. The result was just what my engineer had anticipated. The superintendent of buildings wrote me; I went over and saw the building for the first time. It was plain to me that the error was ours, and could be corrected by an extension of the flues to the proper height. This I did by an addition of 23 feet to each chimney, and now the harder the wind blows the better the draught, and the meter records an exhaust of 723,000 cubic feet per hour, from the building. The members of the committee are so well satisfied that they at once recommended that the other two stacks (with which we had nothing to do) be extended to the same point at which I stopped mine. It has also developed that the position taken by Prof. Campbell, principal of the school, is correct, viz.: that until now the building has never been ventilated at all; and he strongly urged the extension of the other two flues. With water closets the poisonous sewer gas escapes constantly to a greater or less degree, and although very poisonous, has but little odor; while with my system there can be no sewer gas, and if anything is wrong the odor gives the signal at once."

"What are you going to do about the articles in the *Cleveland Leader*?"

"Nothing. I do not have to pay 50 cents per line now, and I hope the articles will do me as much good as did those of the *Detroit News* last winter. Since the attack of the *News* commenced I have had all the contracts awarded there—eleven large buildings."

"Do you often have trouble with your work?"

"I do the most work in my line of any man in America. I never have trouble with either my customers or my apparatus, except occasionally because of *mechanical errors*, as my workmen are not all *perfect*. But I *always* have trouble with my competitors, and in *large cities* it is worse than anywhere else. The worst fight I ever had was the one at Columbus. Then the Pittsburg, Cleveland and Columbus steam heating men combined against me and we got into the courts. The *other side* had the *costs to pay*, and the Columbus board has introduced my apparatus into ten buildings in addition to the four I had when the fight commenced. There are two buildings in Columbus, duplicates of each other. The steam heating apparatus in the one cost over \$7,000; my apparatus in the other cost about \$3,500. The former is cared for by an engineer and an assistant, the latter by a janitor. In the steam-heated building, during the winters of '87 and '88, 167 tons of coal were used; in the other building, (using my apparatus,) 83 tons were used. The high school building in Cleveland contains **22** ordinary-sized school-rooms. The cost of heating was \$1,482.16. The Eagle street building, with my apparatus, contains *nine* rooms. To heat that building it cost **\$139.30**. A janitor takes care of the apparatus in the Eagle street building, and an engineer takes care of the high school apparatus. The original cost of this steam heating apparatus was five times as much as the apparatus in the Eagle street building. Scarcely a month passes that there has not been some expense for repairs on the former; while the Cleveland Board holds my guarantee for ten years without repairs on the latter. The *Leader* don't say anything about these differences, but prints column after column advertising an *error made by one of our workmen*."

In the above interview I refer to an error. There was an error, and a serious one. I herewith present a view of a portion of the roof of the now celebrated Cleveland High School building. The view I present shows two of the four so-called ventilating stacks. One of the two chimneys represented (see cut "A," figure 1,) is one of the two used for one of the closets. I hope the reader will carefully examine the top of the chimney and see if a poorer arrangement could be designed through which an upward moving current of air could pass. Also bear in mind that these stacks terminated *21 feet below the highest portion of the roof*, (that portion covering the very large comb



Cut "A," Fig. 1.

The above cut represents a view of one side and portion of the roof of the Cleveland High School building, and is shown here to represent two of the four so-called "ventilating stacks." Could worse construction be designed?

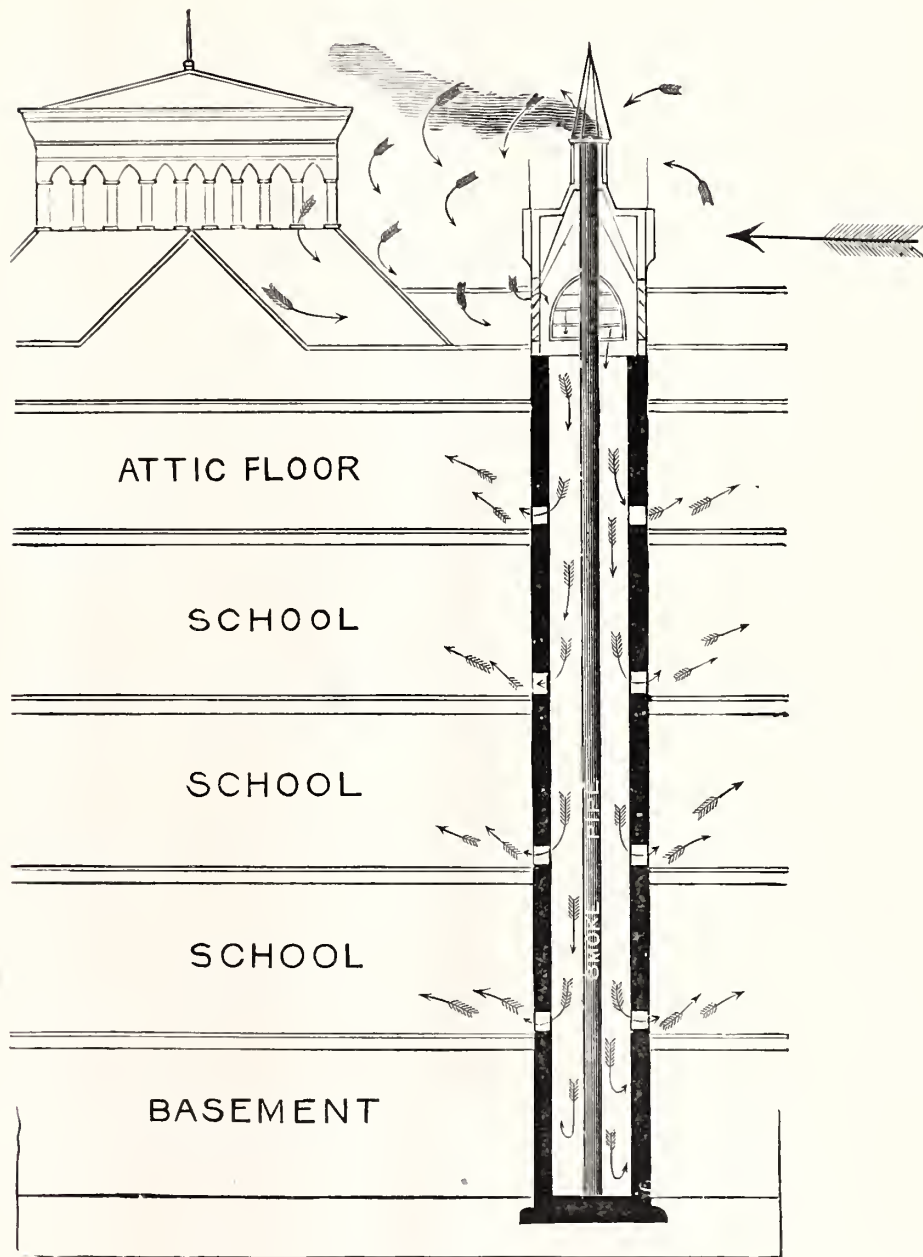


Figure 2.

Sectional view of Figure 1, ventilating (?) flue, in the Cleveland High School building. *Unfortunately* we permitted closets to be attached to flues of which the above is an exact representation. With the wind coming against the roof from the direction indicated by arrow (at right of upper portion of the cut) the result was as indicated by smaller arrows. Steam fitters and plumbers had assured the Board that the hot smoke pipe would "create a draft."

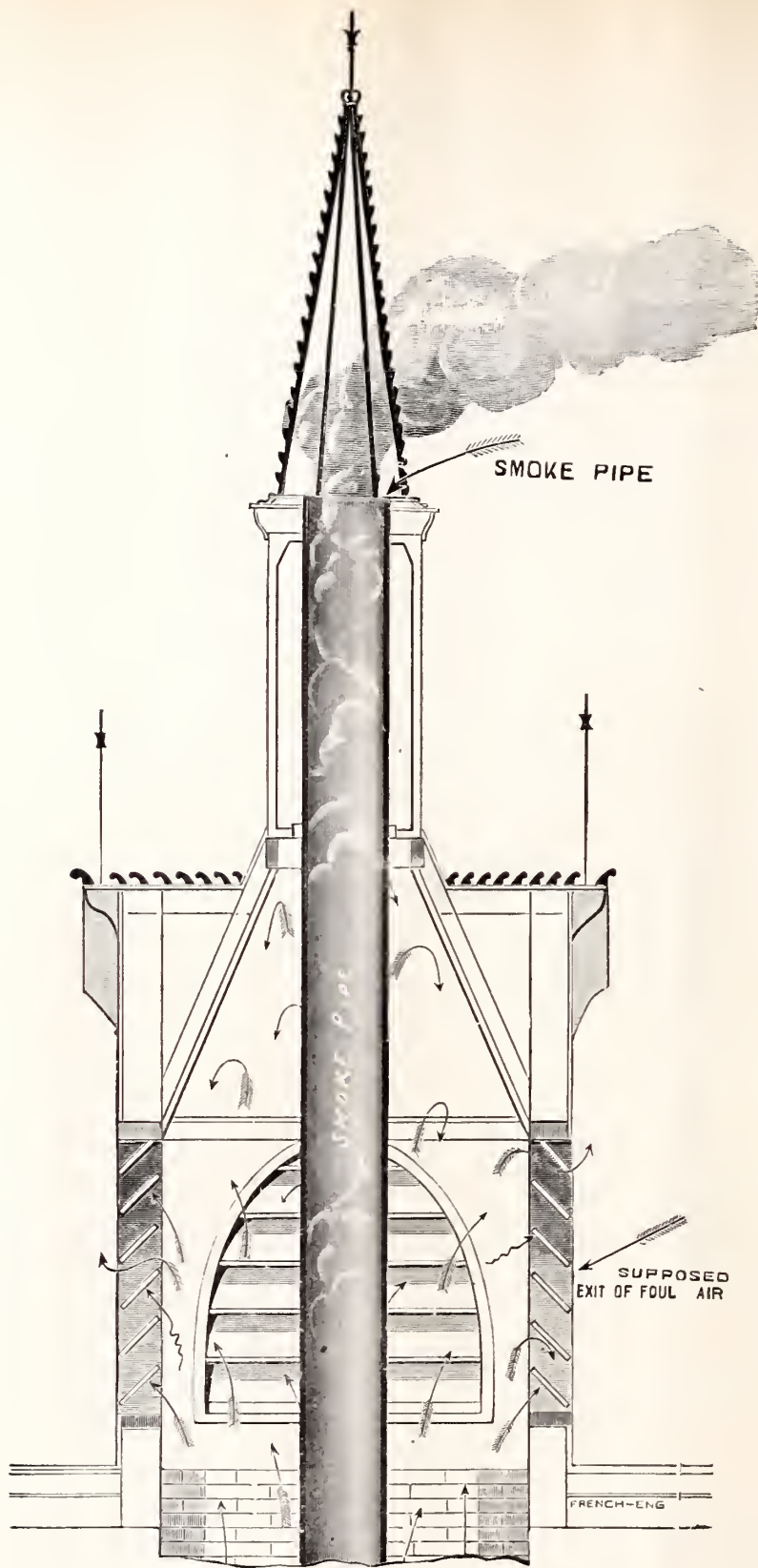


Figure 3.

Enlarged view of Figure 2, showing top of "ventilating stack" of the Cleveland High School building. Could a plan be devised that would more effectually *prevent* successful operation of a ventilating flue?



Figure 4.

Perspective view of ventilating flues of the Cleveland High School building after re-construction by Isaac D. Smead. To get these flues as high as other portions of the roof it was necessary to add 23 feet to each flue. See page 19.,

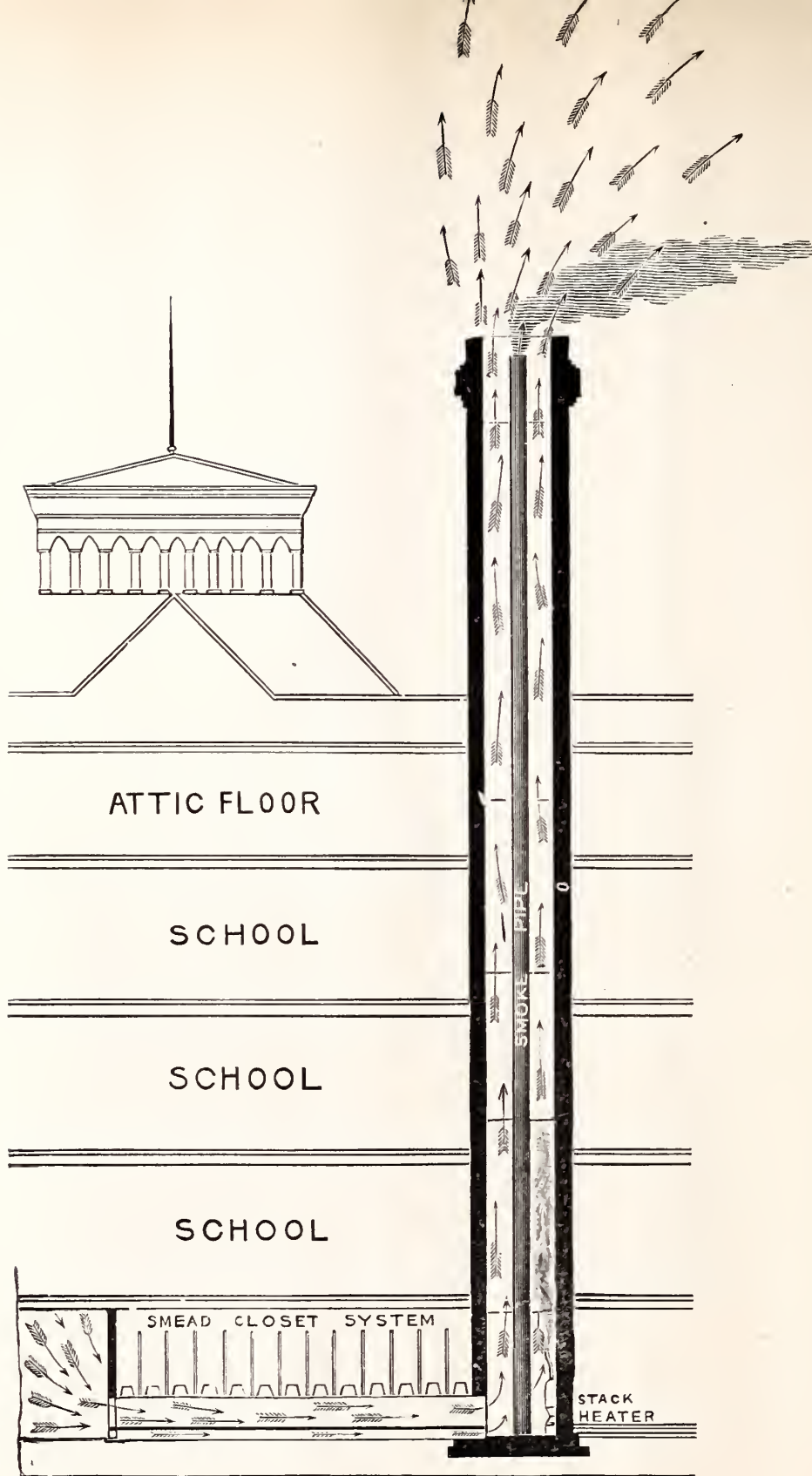


Figure 5.

Sectional view of Figure 4, showing ventilating flue, system of closets and a portion of the Cleveland High School building *after re-construction* by Isaac D. Smead. From the hour this work was completed there has never been a down draft and there never will be. 16,800,000 cubic feet of air passes through each flue per day.

in the center of the building,) and were also several feet below the main portion of the roof.

There never was a day from the completion of the building to this time, that, with the wind in certain directions, it did not blow *down* some *one* of the *four* stacks. The closets worked all right until that time came; then there was trouble.

These flues were connected with the school rooms for the purpose of drawing air from them, (which they never did, as the rooms had little or no air for supply,) and *of course* there was trouble. As soon as I saw the stacks, I knew the cause and at once employed the necessary labor with which (at a cost of several hundred dollars) I raised the two chimneys connected with the closets *23 ft.*, and, from that day to this, there has never been a *down* draft.

I represent the extension in Fig. 5. On the inside of this stack is a large iron smoke pipe, carrying smoke from steam boilers. This pipe appears at the top of the stack, (see Fig. 1,) and also near the top of the stack in Fig. 5. As evidence that it was not the intention of the architect to stop the stacks where they were stopped, I would mention that in the attic of the building I found the iron pipe in sufficient quantity to carry the smoke flue to the height it was originally intended. It would therefore seem that *some one* decided that the ventilating stacks were "high enough" long before they were originally completed.

As the flues as arranged never did draw any air from the school rooms I disconnected them from the rooms and the air passed through the closets from basement of building. *Over 700,000 cubic feet per hour was drawn from the basement through the closet vaults:* and the air to basement was drawn from rooms above and with such force that there has always been a very strong current of air noticeable *down* the stairs leading from corridors to basement; and as Supt. Campbell said to me, "We now have the best system of ventilation that we have ever had."

The result was so positive that school was resumed at once (it was dismissed only four days) and from that time to this over *thirty three million, six hundred thousand cubic feet of air* (as demonstrated by air meter) *have daily passed through the closet vaults and out at the top of those ventilating stacks, the tops of which are over 100 feet above the ground.* The following from the *Cleveland Plain Dealer* gives the opinion of Health Officer Ashman upon the subject.

"The *Leader* in its issue of Saturday printed under the headline "Death in the Air" an absurd article aimed directly against the Smead system with the intent to create a sensation, and *indirectly* against the Board of Education. Without the *slightest ground* it declared that there are many cases of typhoid and malarial fever near the Central High School, that the students are prostrated and that the people in the neighborhood look in vain for relief. *These are lies pure and simple.*

"Since January 1 not one case of typhoid fever has been reported within the district bounded on the east by Giddings avenue, west by Sterling, north by Euclid and west by Scovill. This is lee way sufficient.

"I feel it my duty to contradict that article," said Health Officer Ashman yesterday. "People out of town reading it would gain an impression that there is a regular epidemic in that locality, that children are dying by scores and that the air is laden by pestilential vapors while in fact *that district is the healthiest in the city. I have yet to hear the first word of complaint from scholar or teacher or resident in that locality.* The system is working nicely, *everything is sweet and clean any one the least acquainted with the chemical changes which take place would know that no germs of disease are given off.* Not a case of typhoid fever has been reported from that district. If a man is in the wrong he should be punished but it is dangerous business to throw abroad the assertion that the health of the city is endangered and it should not be tolerated. *Strange what little things influence a paper sometimes.*"

"With shocking audacity the *Leader* says: 'Never perhaps in that part of the city has there been so much sickness as at the present, and often the visits of the doctors are ended by sad emblems of crape on the door. A number of people living near the High School building are at present suffering with malarial and typhoid fever.' And all because the pap bag is not as open as it should be and the chances for its opening are sealy."

After some two months trial that board paid us the amount due and the superintendent of buildings recommended that the other two stacks (with which we never had anything to do) be extended, as I had demonstrated their utter uselessness as originally erected. This was never done.

The *Leader* had quieted down and all seemed tranquil on the shore of Lake Erie until some six weeks ago, (about election time !!!) when the board voted to erect another building, duplicating one erected two years ago, and containing our complete system. Contract to furnish apparatus was awarded us, and then the *Leader* again commenced to *howl*. They could not say there were "down drafts" as before, (a condition we never denied) and so it began to lie about other matters, making claims as referred to in the quotation from *Plain Dealer*, and many, very many more, similar false charges.

Naturally the people living in that ward became uneasy and frightened. It is *never* difficult to *create* a panic, but hard to *stop* one. We have been severely blamed by our friends and customers because we did not sue the *Leader* for its many libelous articles; but until it had almost caused a senseless panic we did not fully realize the damage it had done, and it was then too late to satisfy those who, not knowing the actual facts in the case, would only be satisfied by the removal of the closets; and as that, and that only has been the object of the attacks (made by those whose only interest is to continue the old system of sewer pipes, filled with poisonous gases, and of catch basins discharging these gasses into the street and a hundred other dangers that cannot attach to the dry closet system) it must, for the time, bear the burden of the result; but if I can judge its future by the scores and scores of communications I am receiving from all over the country (of which the following is a specimen) I am not very much alarmed because I have incurred the displeasure of a few newspaper writers, who for *cash* would write on the *other side*; and while I have no desire to enter into *personal* controversy, I should not hesitate to do so with *one* who has been quite prominent in the attacks upon me and my work. I don't know that I have ever courted a fight of any kind; nor do I remember of having *run* when engaged in one.

I would much rather be an inventor and manufacturer who has made some mechanical errors, and who cannot always secure absolutely perfect workmen, *than to be looked upon by my neighbors and fellow citizens as one who possesses no qualifications which entitle him to come within a circle that gentlemen are permitted to enter*; one whose personal habits and daily life are such as to subject him to the *contempt of all honest and fair minded men*.

ISAAC D. SMEAD.

THE DISPOSAL OF SEWAGE.

THE ANNALS OF HYGIENE, THE OFFICIAL ORGAN OF THE STATE BOARD OF HEALTH OF PENNSYLVANIA,
JOSEPH F. EDWARDS, M. D., 224 SOUTH SIXTEENTH ST., PHILADELPHIA, PA.

The publication, in our last issue, wherein we described a new method for the disposal of sewage, *based upon the principles of nature*, has called forth considerable comment. Among other communications, we have received one from a physician in Canton, Ohio, who, it seems, was already familiar with the method described, and who writes because of a newspaper publication condemning the system, which he desires to have verified or disproven. The newspaper publication referred to claims that the gases of decomposition that are given off from the vent stack descend into and poison the surrounding atmosphere, and that, as a consequence, the prevalence of typhoid and typhus

fevers and malarial diseases, has greatly increased in localities where this system has been introduced. Our correspondent asks :—

“May dangers be apprehended from atmospheric influences?” * * *

“This system has many good features—if it has a lame place this is the spot.”

Before deciding to describe this system in our pages, we made a most critical examination of its working qualities, and then set to work to try to find fault therewith. This question of the contamination of the atmosphere suggested itself to us and received due consideration. We felt that the amount of foul gas discharged is *so infinitesimally small* when compared with the great bulk of the atmosphere into which it is discharged, that it would be absolutely inert, to say nothing of the purification that would at once take place. We felt that the idea that any ill results could possibly accrue from these gases so thoroughly diluted, would be akin to claiming that *a teaspoonful of water taken from a hoghead of water, into which one drop of alcohol had been placed, would produce profound intoxication.*

This was our own view ; but feeling that we might be in error, we wrote to several physicians in different localities, where we knew this system to be in use, to ask whether an increase in prevalence of the diseases already named had followed its introduction. In no instance does the experience of scientific men give a shadow of support to this unfounded newspaper representation. One prominent physician writes so strongly that we give some extracts from his letter. He says :—

“Your letter of inquiry at hand. It is with some degree of pleasure I write you hastily about my experience with this system, because I have noticed some *villainous* attacks on the system. I was health officer of this city at the time these closets were introduced and in five years I did not hear a single complaint from people who lived in the neighborhood of the school buildings, either on account of odor or sickness. During this period the closets were introduced into all of our school buildings. Now we have over twenty buildings supplied with these closets. As a matter of record our city is exceptionally free from Typhoid, Typhus and Malarial Fevers, and I do not now recall any cases occurring in proximity to one of our school buildings. *These closets have replaced all others in our school buildings,* and I have examined them repeatedly and never found one that allowed the faintest odor to get out into the building. And right here, let me say that this is the only system I know of where inside closets have this record.

To consider the matter scientifically, if there are Typhoid, or other disease germs in the excrement, would you not prefer to deliver them *well dried, high up in the air,* heated by hot air and smoke, *rather than deposit them in any moist sewer which is connected with our school buildings.*

That diseases are scattered by this system is abundantly disproved by acquaintance with the places where they were extensively introduced, as per example: Toledo ; whose mortuary statistics are correct, and which shows that ours is one of the very healthiest cities in the country.

“That *this theory is mere moonshine,* I know from personal observation. I have no interest in this matter outside of the interest in humanity, and I write you thus strongly because I have seen base attacks in papers which have no foundation in truth.

As I have no definite knowledge on this subject from my own investigations, I cheerfully, for the good of the cause, write you.”

We, ourselves, can say, with the author of this letter, that “*we have no interest in this matter outside of the interest in humanity,*” and we have carefully refrained from mentioning the proprietors of this system. Our attention was called to it ; when the theory was explained to us we felt that it was a correct one, and when we looked into the matter, we found that the merits of the theory were sustained by the practical working of the system. This is all ; it is, *we believe, a great step in sanitary progress and we are anxious to give it all possible publicity.*

THE DRY CLOSET AND CREMATION SYSTEM.

FROM TOLEDO MEDICAL AND SURGICAL REPORTER FOR JUNE, BY THOMAS HUBBARD, M. D.,
READ BEFORE THE TOLEDO MEDICAL ASSOCIATION, MAY 10, 1889.

The reader of the sanitary journals of the day cannot but be impressed with the fact that the problem of the disposal of sewage matter is yet far from a satisfactory solution. Comparatively speaking, the sewer has been a great boon to the inhabitants of large cities because it has taken the place of the old and dangerous methods of disposal of city excrement; but to-day we stand annoyed and afflicted by this institution of the age of city building, the intake in our homes aiding directly and indirectly in the destruction caused by zymotic diseases through the specific or general effect of its omnipresent gases; and the outlet endangering our water supply, the fearful epidemics traceable to this source having become a matter of history.

But there comes to us a ray of light in this time of perplexity. Let us look closer. Does it come from the laboratory of the sanitary scientist, or from the work-shop? Shall science add to her long list of accomplishments in behalf of the welfare of mankind one more triumph, or shall the credit be given to that less pretentious class who have solved many a great problem by indomitable physical energy fired by a conviction that the accomplishment is within the bounds of possibility; each experiment, crude at first, and often a disastrous failure, only serving to stimulate to another effort until we can trace the rough and broken path of progress, now turning back on itself, now upward, until it reaches the lofty goal where it shines forth, enlightens the world and benefits mankind.

A mere spark of a suggestion, dim and unattractive, given to the world by a Canadian gentlemen of great acumen and intelligence, was fanned into a blaze in the workshop of a mechanical engineer. "A new sun has risen in the sanitary heavens!"

As citizens of Toledo we should take a special pride in the fact that the dry closet system was first successfully introduced into our own school buildings, and in claiming its inventor as a fellow citizen. As a profession we should congratulate ourselves in that we have been among the first to appreciate the merits of the system and encourage its introduction. The inventor himself says in his book that he regards the medical profession as the most unselfish of men, laboring unceasingly to lessen sickness and disease directly against their own business interests.

But what are the essential principles of the dry closet and cremation system as invented and introduced by Mr. Isaac D. Smead? Briefly stated they are as follows. By a system of ventilation based entirely on *natural forces* there is supplied to each occupant, of a school room for example, between 1,500 and 2,000 cubic feet of warmed fresh air per hour. Each cubic foot of this air is capable of evaporating about one grain of moisture, assuming that it leaves the room at a temperature of about 65 degrees and 81 per cent. rel. humid. (which is a fair average of many experiments). This volume of air per capita is then capable of evaporating many times the amount of total watery excreta of each individual.

But the question arises in the minds of all—how obtain a perfect exposure of the excreta to the out-going current of air? This is accomplished in the so-called "dry-closet." Let us begin with the ventilation system, omitting unnecessary details. A very large volume of air is warmed

about the great furnace placed in the basement and surrounded by a non-conducting brick wall. Fresh outside air has free access to these furnaces. This is conveyed by ample air conduits to the rooms above that are to be warmed. The outlets to these rooms are placed in the base-board and the air leaving the room circulates freely under the floor, thus producing an equable temperature at floor and ceiling, and thence downward into the basement to the so-called "foul air gathering room." This opens into the closet vault.

Now a word as to the construction of the closet vault. It is merely a long iron and brick air-conduit, the faecal deposits being received on a raised brick platform. The average section area of these vaults is 3 feet by $3\frac{1}{2}$ feet, and they are from twenty to fifty feet long, depending upon the number of seats necessary to be accommodated. This long vault is in free communication at the end opposite the "foul air gathering room" with a great ventilating stack that extends from basement to a point above the highest peak of the roof, and is built solid, having no inlet except the one from the closet vault.

Let us now follow the course of the air from intake to outlet. The fire in the furnace is started and the air circulating freely about its extensive superficial area is warmed by direct radiation. It is rarefied and its specific gravity raised until it is displaced upward by the cooler and heavier air entering freely at the large intake windows. This process continues uninterruptedly, the cold heavy air exerting a constant upward displacement on the column of warmed air which is thus forced up the ample air conduits into the rooms above. Here this warmed air circulates freely, dissipating a certain amount of its heat until it is finally forced out at the outlets in the base-board and finds its way under the floor of the room to the "foul air gathering room," and thence to the stack in a continuous current.

The force for upward displacement continues as long as the air about the furnaces is warmed, and its effect is a force for onward and upward movement to the air in the school room, in the foul air gathering room, in the vault, and in the great ventilating shaft, alike, indirect though it may be. Thus is an immense volume of air, flowing at the rate of four to six miles an hour through the closet vaults, brought in contact with the deposits of faecal matter.

The rapid drying prevents putrefaction, and the mass is not even disintegrated, retaining the original form. The contents of such a vault are aptly compared to the "buffalo chips" of the plains. As I have said before, the vaults are constructed fire-proof, and, since the deposits are mixed with paper, what more simple than to set fire to the contents of the vault nearest the "foul air gathering chamber," and soon the whole mass is reduced to ashes. This has become a practice in all buildings containing the system.

Let me call attention to the important results. Natural forces only are involved and hence cheapness of operation is secured. The two most essential features of a wholesome school house are secured, namely, pure air and an odorless closet. The ultimate disposal of the faecal matter is all that can be desired by the most skeptical sanitarian, the most visionary bacteriologist, or the most economical member of the Board of Education.

A review of a few of the more important objections that have been raised against the dry closet and cremation system may serve to bring up points for discussion. It is asserted that there is a liability of back drafts forcing the air from the closet vaults back into the rooms. To insure an upward current in the ventilating shaft under all circumstances a small furnace is placed in the base of the main shaft and a constant fire is kept up when the large furnaces are not heating. The force for displacing upward, i. e., the column of heavier air, is now transferred from that pressing in at the intake of cold air to the column represented by the air in the "foul air gathering room" and the rooms above it, since this column is made relatively heavier by the heating and rarefaction of the air in the main air shaft, and a constant current upward is maintained and a proportionate inflow at fresh air intake is insured.

But let us consider in detail the accusation that the foul air passing out at the mouth of the

main air shaft is capable of spreading the germs of disease. In the first place, consider that there is no putrefaction in the closet vaults. The deposits are dried out very rapidly, hence the gases given off are not to be compared with those escaping from a sewer in any sense. Such decomposition as does take place is a purely natural one, merely a continuation of the process begun in the intestines and while there is considerable odor at the outlet of the shaft, yet when we consider the great exposure to diluting volumes of air, the disseminating power of the winds, the purification of the air by oxygen and sunlight, it does seem indeed a visionary evil. The dilution of the gases is under the most simple calculation in direct proportion to the square of the distance from the mouth of the stack. Under this law 10 parts of carbonic acid to 1,000 parts, for example, at a distance of 100 feet from the shaft outlet would become diluted to 10 parts to 40,000,000 of air.

But certain alarmists assert that typhoid fever is disseminated over the district. The drying process most certainly destroys the bacillus typhosus although the spores may survive. The faecal matter as it escapes from the bowel is mixed with mucus and albumenoid matter in such quantity that a thin pellicle forms around the mass during the drying, and it seems impossible that any germs can escape. Again, does it occur to you how rarely a child sick from typhoid fever would be present at school?

As regards ordinary zymotic diseases, surely the perfect ventilation secured will lessen the danger of spreading among the children of the school, both by the direct dilution of all emanations and indirectly by sustaining the natural vitality and resisting power of the child.

We can bring to bear some testimony from the extensive experience of many of the great irrigation and more particularly the intermittent filtration farms of England. Prof. E. Frankland read, before the International Congress of Hygiene at Vienna in 1887, a report on the "Purification of Sewage and the Utilization of Human Excrement with Special Reference to the Prevention of River Pollution." In both surface irrigation and intermittent filtration the deposit from the sewage matter becomes ultimately a part of the surface soil and is consequently often blown about as dust and the farm hands are constantly working in it. Accurate statistics from the nine prize sewage farms, including the one that receives the sewage from the city of Birmingham, show that there has never been a case of typhoid fever or zymotic disease traceable to this source. This is evidence as conclusive as may be that disease germs cannot resist the purifying power of desiccation in the presence of oxygen and the sun's rays.

How visionary then is the charge that typhoid fever can be disseminated by the gases from the mouth of the foul air shaft, when the diluting, dissipating and purifying influences of the sun and a limitless supply of oxygen are brought into play.

No unprejudiced person, professional or layman, can inspect the dry closet system as in operation in our school houses here, and not be impressed that it is one of the most influential of the sanitary improvements of the age. Its range of usefulness is almost limitless; the comfort it insures from being located in the warm basement of school houses; the constant renewal of the air in the basement; the simplicity of construction, and lastly the ultimate cremation of the vault contents recommend it to every person "interested in the welfare of humanity."

DISCUSSION ON ESSAY.

“THE DRY CLOSET AND CREMATION SYSTEM.” READ BY DR. THOS. HUBBARD, BEFORE THE TOLEDO MEDICAL SOCIETY, MAY 10TH, 1889.

Dr. Chas. J. VanPelt opened the discussion on the paper. The first introduction of the system into the city schools was during his service as health officer, and he was called on to make repeated inspections of the Dry Closets. He approved of the principle from the beginning and was pleased to note the many improvements that have been added. He has watched the growth and perfection of the details. The introduction of the stack heater insures safety and freedom from back draughts. The idea of cremating the vault contents came about as the result of the use of the stack heater and the perfect desiccation by the continuous currents thus established. He has frequently seen the contents of a vault reduced to ashes in a very short space of time. He further said that it is the only system of inside closets that gives out no odors. Gases will rise in spite of the most perfect water appliances and plumbing. He has examined closets having an expensive mechanical exhaust system and found considerable odor. No practical medical man would entertain the visionary objections urged against the system by the disease germ theorists. If there be any truth in the theory at all, sewers are certainly much more to be feared than the dry closet and cremation system. The gas from a sewer escapes at the ground level and we must constantly inhale it, while the gases from the foul air shaft are delivered high up in the air and reach the lower levels only in a state of great dilution, and are perfectly harmless.

Dr. Wm. C. Chapman said: “After having made a thorough inspection I can say that I consider the dry closet perfect in principle and in its practical operation. Do not think that back draughts are possible with a fire burning in stack heater. Comparing it with the sewer, consider that the germs are not destroyed in the sewer at all, but simply increase and ultimately find their way into the drinking water, while in this system they are rendered inert and destroyed by dilution in pure air and the purifying effect of the sun’s rays. Toledo has a great many buildings containing the system and we have a minimum amount of typhoid fever—less than in any other large city—which is the kind of evidence that counts in a discussion of this nature.”

Dr. Joseph T. Woods said: “The explanation of the mechanical features of the system were very interesting to him and are based on sound principles. He regards the warming of the floors by the outgoing current as a most important feature. The old methods of heating warm the head first and the evils following the state expressed as ‘hot head and cold feet’ result. From personal inspection I can assert that I consider the dry closet as near perfect as we can conceive.”

Dr. S. S. Thorn: “We are all agreed that the heating and ventilating as introduced into our schools is the best. I have no fault to find with it. Now I am a believer in the germ theory of disease to a certain degree, but fail to appreciate the arguments of many who are opposing this dry closet system from this standpoint. *Moisture is most favorable to growth of say typhoid germs, and I believe that dryness is fatal.* I think that persistent desiccation is a most potent germ-destroyer. Practically I am convinced, from a great many years of observation, that typhoid fever is not propagated in this city, although, as has been said, we have a great many dry closets in use here.

I repeat that I consider it as infinitely more potent as a germ destroyer and think that the objections raised against it are not well founded."

Dr. James F. Aris said: "That as far as typhoid fever is concerned the statistics show that Toledo has been free from the disease for many years, and hence this part of the evidence becomes negative in character. Absence of the disease goes to prove that it does not propagate the disease, but does not prove that it is a disease germ destroyer."

Dr. Geo. A. Collamore (Health Officer) said: "I have had occasion to examine the High School, and old building into which the Smead system has been adopted. I am impressed with the fact that the details are of great importance and in all cases careful and watchful attention must be given—avoiding errors in construction and careless operation. I am convinced that where the construction is perfect in its details the system works perfectly. I see only one possible danger, and that is from back draughts. I say possible, but I know of no instance where this has been charged against it in this city. Compare the ultimate process, cremation, with the ultimate disposal of sewer contents; in the one harmless gases, in the other our streams are polluted and often our water supply is infected. I examined the closets as adapted to an old large school building, and appreciated that it was a difficult undertaking on the part of the engineer. I could detect no odors at all, and made close inquiry of the school girls who were eating their lunches in the basement room adjoining. If there be any time that one would be apt to detect an odor it would be under such circumstances, and the simple fact that they did go to that room to eat is evidence conclusive that the closets were odorless. The superintendent told me that he had heard no complaints and that school attendance was quite up to the average. That disease can be disseminated from the mouth of the foul air shaft I regard as too absurd for discussion. *Typhoid fever germs must reach the victim by the stomach and intestines.* Nurses in fever hospitals breathe the same air as the patient with perfect impunity and rarely contract the disease. Diphtheria is a disease that seems to demand a moist medium of contagion—moisture is essential to its propagation. The ultimate cremation meets the demands of the most skeptical bacteriologist and the most extreme sanitarians."

Dr. John North asked if the faecal matter was allowed to remain in the vaults during the summer. He referred to the drying and escape of germs from the shaft outlet as a possible source of danger, but does not consider it an objection of practical value. He would expect that a certain amount of moisture would be deposited under the floor by the outgoing current.

The discussion was closed by the essayist answering Dr. North's question about the condition of the vaults in summer. The cremation is done at the close of the school year. During the warm school months the stack heater is constantly in use. The humidity is rarely greater than 81 per cent rel. humid. and hence the cooling under the floor does not precipitate any moisture.

EXHAUSTIVE TREATMENT BY JOSIAH HARTZELL

ON THE SMEAD SYSTEM. HE HOLDS THE CANTON HIGH SCHOOL SAFE AND RIDICULES THE SCARE AT CLEVELAND.

EDITOR REPOSITORY: The adoption of what is known as the Smead plan of heating, ventilation and waste disposal in schools and public buildings has been the theme of much discussion. Although this has often been pushed to the verge of acrimony, it has had a most wholesome result, enlisting public attention to the study of topics of vital import, in spreading knowledge and, sometimes, revealing a woeful lack of knowledge.

The heating and ventilating feature of the plan seems almost to leave nothing better to be desired. It has the capital merit of great simplicity, only one apparatus being required for both heating and ventilation, instead of double devices. External air, as much as may be desired, is warmed, and is admitted into and drawn out of the rooms in such a manner that: first, the fresh air and heat are most equably diffused through every part of the room; and second, so that the extracted air is always that which is most heavily charged with the products of respiration.

All the air used in the building is drawn into a ventilating shaft, or foul air flue, of proper dimensions, and passes out at the top of the building. After leaving the rooms the still warm air is made to pass under the floors, an arrangement which must figure not inconsiderably in economy of fuel consumption.

The merit of this plan is not so much in the novelty of the principles involved as in the generous and ingenious application of these principles. The mechanism of the plan is on an adequate scale. It is simple and admirable. The average results, in a sanitary sense, are such as might reasonably be expected from a system of the very best order. Such is my opinion. Others claim to entertain contrary views, but more particularly in regard to the wisdom of employing the Smead plan for disposal of the waste matters emanating from such a building.

When it was proposed to introduce this system into the Canton High School building the novel part of the plan did not commend itself to me. The impression of the writer, at that time, is best expressed by a quotation from himself, as printed on page 204 in the Annual report of the Ohio State Board of Health for 1886, as follows:

"What may be regarded as a curiosity in this field is a recent practice adopted in certain school houses. The privy seats, for each sex, respectively, are all in a row in the basement of the building. Under each of these rows of seats all is open from end to end. The building is heated with hot air and has a high ventilating shaft. Warm air, having served its purpose in the school room, is drawn into the ventilating shaft, passing, on its way, through the space under the two rows of seats. The excreta, yielding up all moisture to this current of warm air, are reduced to a dry, insignificant bulk, which is shoveled into the furnace and burned. This method has been introduced into the costly new High School building recently erected in Canton, but not yet tested. Its merits cannot, therefore, be properly characterized; though much is claimed for it in the way of testimonials, a kind of evidence which is very apt to be devoid of scientific authority."

If, in trying to solve this problem, only newspaper contentions had been relied on for testimony, this state of mental indecision might have continued on till now. But every man has two eyes, two ears, and one nose for his own use. As the result of personal inspection, and of all the direct testimony available, it now seems to me that for a large school building, this plan of waste-disposal has advantages over all the others which I have any knowledge of.

As to gases getting into the house, the testimony of the inmates is decidedly in the negative. That is my experience. As a matter of fact wet excreta must remain in a wet state more than a day, before they can yield up any gases deleterious to health. And dry excreta are as harmless as the dust in the road.

Look at the matter a little. The formula for air pollution by gases (not suspended matters), as near as one can be made, requires the concomitance of moisture, heat and ammonia, these being important in the order in which they are named. Ammonia, composed of nitrogen and hydrogen, may be present everywhere. So of heat. But the Smead plan robs the forces of the most important element in fermentation, the water.

This question of the comparative merits of the different systems employed for the disposal of human waste matters is not only of the utmost importance, but it is one of the most complex that engineers are confronted with. It is rare that it can be answered the same way for any two towns or cities. Water-carriage and Smeadism are incompatible. The latter is not, in its present state of development, adapted to private houses—its mechanism seems necessarily to be too large and costly.

But when large numbers are gathered under the same roof—in one plant, so to speak—the comparative cost is less than water-carriage, while the service rendered is equal, if not superior, both in safety and convenience, as well as cleanliness.

The name under which these methods of heating, ventilation and disposal are grouped place the endorsers of them under some disadvantage. *It is impossible to defend them without blowing the horn of Mr. Smead. This feature has been made very prominent in the recent controversy in Cleveland, in addition to which a great abundance of reckless balderdash has been printed in the effort to induce people to believe that the air current from the ventilating shaft of a certain school house was spreading disease and death.* Germs, it is said, are spouted into the sky, and then proceed to settle down on the contiguous population in the shape of a typhoid mildew. These things are ridiculous, but not so ridiculous or surprising as the ignorance, prejudice, or partisanship of a school board in the city of Cleveland which is swayed by such Munchausenisms.

The least that these functionaries should have done, and the proper thing to have done, under the circumstances, would have been to insist upon a judicial investigation. That is the way a controversy of this kind recently terminated in Columbus. The law court precipitated the fogs raised up by the newspaper court, speedily and effectively. There may be mechanical defects in buildings, introduction, dimension or adaptation, as in the construction of anything else; but as to the correctness of the hygienic features involved, there can be but one opinion on the part of all who can rightfully be regarded as sanitary experts. In a case of this importance both sides should crave the backing of a decision from a disinterested court, and there let the side which cannot sustain itself go down.

In these Cleveland press reports frequent mention is made of the name of Dr. G. P. Ashman, the Health Officer of Cleveland. The head-lines array him against the Smead plan, but the perusal of Dr. Ashman's reports fail to justify the impression sought to be thus made.

To be sure Dr. A. does not argue his case with the same virulent positiveness which characterizes the sage atmospheric philosophers on the other side. But it is also well for candid inquirers to remember that "fools rush in," and sometimes, unadvisedly; that a little learning is dangerous. Dr. Ashman is a man of large acquirements, and a scientist of established character.

Should he express the opinion that air loaded with moisture from fresh excreta, and disposed of as indicated, would increase disease, the statement would *far outweigh all the partisan diatribes of the press.* It would awaken a wide interest. Such is the power of a well-earned reputation, a thing of slow but solid growth, an eminence which cannot be reached by threats, or bribes, or shallow puffs. It is most improbable that he will express such an opinion, because it would not be justified by the record of scientific knowledge and experiment up to the present time. And yet he does not rush at the microbe-haunted philosophers with uplifted hammer and sledge of big adjectives.

His position says: Your claims are not justified by sanitary experiment; but prove that there is more zymotic disease, and that this disease was caused by the addition of air from the ventilating shaft. From all that has appeared with his sanction no such proof has been forthcoming, and for the best of reasons.

The person who undertook to make this proof would be confronted with the fact that one-fifth in bulk of the air is free oxygen. *Oxygen, king of the elements, like the king of beasts, has a most greedy appetite, and its affinities are boundless. It assails, and splits, and changes, converting things noxious into substances inert, or wholesome.* It is nature's grand purifier. A proper investigation of this subject would involve a long stop with oxygen, but this is the realm of chemistry proper, and would suggest a charge of pedantry. The upshot of it all would be, however, that if we will only keep our interiors supplied with air equal in purity to that which nature always supplies in bountiful stock outside our houses, then we shall have nothing to fear from our air supply.

But the air from the Smead flues is "charged with the moisture from fresh excreta." So it

is. And so the city of Manchester, England, and many other cities, including most of Edinburgh, Scotland, dispose of all, or nearly all of their wastes by the tub and pail system. The wastes are kept in the houses and they smell to heaven. But the disease and death rate is low. Why? Because the municipal functionaries always remove the vessels before fermentation has had time to commence, and replace them with clean ones. Part of the gases arising from putrefaction are most deleterious, but are odorless; the bad-smelling gases, as also the odors from fresh excreta, are not liable to do much harm. In fact, when these very same odoriferous gases come up out of the earth in some Saratoga, or other fancy spring waters, they are held to be ever so wholesome, and to cure no end of maladies.

In the middle of Paris there is an immense fertilizer factory. Into one side, every night, are driven hundreds of wagons corresponding to our "excavators." Out of the other side, every day, are shipped barrels of dry and powdered fertilizer. The moisture has all passed up skyward, *a la Smead*. Nor is this moisture lifted from fresh wastes, but from the most rotten, pestiferous stuff that can be imagined.

Sanitary literature abounds in praises of garbage crematories, such as are in operation in Minneapolis, Milwaukee, Chicago, Buffalo, etc. They receive fish, flesh, fowl and filth in all states, and deliver the ashes. To be sure, all is burned, *but not until the moisture has been expelled—that goes into the air*

If hurtful bacterial defilement of the atmosphere were possible by any such means it would be by such institutions as these. The evils which are said to ascend into the cerulean ether from the Smead flues, and to descend upon contiguous humanity in the shape of envenomed micro-organisms reside in warped imaginations, and nowhere else. Take the cesspools of a city. They cover acres of surface. Their foul contents are left to ferment and putrify year after year. Clean air gets in, loads itself with all that is most vile and poisonous, and issues forth to mix with the outer air. And yet aerial dangers from cesspools have never been much dwelt upon. If these cesspools were absolutely dry every morning, and if they never contained wet fæces over twenty-four hours old, they would approach the Smead plan in harmlessness. As it is, these receptacles of putrefaction deserve nothing but condemnation; but most of their agents for harm go down and not up; and those that do ascend fly into an embrace which quickly extracts their sting and hands them over to plant-life to assume new forms that do not curse, but bless. If our sky-germ vaticinators would come down and lay hold of the old cesspool their crusade would have some sense in it, and would deserve universal co operation.

Our own city has been no stranger to this interesting discussion. Free lances have been broken pro and con. This was to have been both expected and desired. It has been a public educator. It has riveted the sound maxim that "man's breath is his own greatest enemy." It has fixed the open fire—the foul-air flue—irrevocably in its proper place. But the wasteful open grate, leaving behind only five per cent of its radiated heat, would never do in our great school houses. The new plan supplies every lacking requirement, both in respect to health and comfort.

The new method of waste disposal is claimed to be, as yet, in the experimental stage. In the sense of not yet having silenced all opposition it is an experiment. Only let the experiment be fairly and thoroughly made and impartially decided. Partisanism and microbial charlatanism should be brushed aside so that we may get at the exact truth. *It is pitiful to see vested property interests*, in and out of school houses, and above all *the welfare of school children*, preyed upon and buffeted about on such farcical grounds as have recently been published, and the fact that such things have been done in Cleveland merits no more consideration than if these examples had been set in the heart of Utopia itself.

WILL USE THE SMEAD SYSTEM.

WARREN, O., May 11.—[Special to Plaindealer.]—At a meeting of the County Commissioners to-day, it was decided to use the Smead dry-closet system in the Children's Home, to be erected this season. This decision was arrived at after a thorough investigation into the charges made by the enemies of Smead.

ONLY A SCARE.

After months of wire pulling on the part of interested persons, a popular scare was at last put *en scene*, which resulted in the removal from the Central High School of the Smead system of dry sewerage.

To say that nineteen-twentieths of the objections urged against the Smead system are absolutely without ground or foundation would avail nothing at this time. The people are frightened and they will not stop to reason.

Tell us, ye bright advocates of mediæval sewers, which is more dangerous to public health: Ten thousand sewer connections, back-vented from private dwellings, together with the catch-basins all over town, or the chemically pure gases, freed of their poisonous substances by combustion?

Which is the better—the safer? Ten thousand house sewer connections, directly poisoning as many families, or five school building stacks that do not at all connect with the buildings in which they are placed?

And what about the 15,000 or more vaults that exist in the portions of the town not reached by sewerage? If it is in the nature of this aroma to kill, how is it possible that this community can live and thrive?

In the Central High School the system of ventilation is admittedly defective, but that is no reason for the failure of the Smead system. The death of Prof. Campbell is charged to the "system," and yet a reputable physician returns the cause of death as apoplexy! The system of ventilation will not be improved by the re-introduction of the old sewerage plan; it will only be more markedly felt.

But it's popular, now, to howl about the Smead system, and while the people are in that state of mind anything that bears the name of Smead will act upon their diseased imagination as though the name alone were hurtful. It's a case of Christian science reversed. In the one case you believe yourself cured, until your illness has left you. In the other you think yourself ill until you do take to your bed.

There are men in this town—men, too, who know as much about the Smead or any other sewerage system as a cow does about dominoes—who have talked themselves into such a fever of anti-Smead excitement that they have gone stark mad. For such there is no cure. But for the thinking people the time will come when they will acknowledge their error in driving out of the town the best system of school sewerage ever introduced here.

Yesterday afternoon some seventy-five physicians examined this terrible death trap and strange to say, pronounced it perfectly harmless, and a good sanitary arrangement. Have they all got Smead's money in their pocket?—*Town Topics, (Cleveland,) May 11.*

WHAT A CHEMIST FOUND AT THE CLEVELAND CENTRAL HIGH SCHOOL.

Prof. A. W. Smith, of the Case School of Applied Science, has completed his analysis of the air in and about the Central High, Outhwaite and Waring School buildings, and his report was forwarded to Health Officer Ashman Tuesday morning. Prof. Smith says;

According to your request, analysis of the air of the Central High, Outhwaite and Waring Street School buildings have been completed, with results as given below:

Friday afternoon of April 26 samples of air were collected from within the two stacks of the High School building, near their exit. The fires in the stacks were then extinguished, and Saturday morning samples were taken from rooms 6 and 18, from the boys' closet, and on May 1 in the office. In these samples ammonia and hydric sulphide were determined to ascertain whether air or gases from the stacks escaped into the building. The air from the north and south shafts contained respectively, 1.22 and 2.74 parts of ammonia per million, with considerable quantities of hydric sulphide; room 6 contained 0.13 parts; room 18, 0.27 parts; the basement closet, 0.06 parts, and the office, 0.04 parts of ammonia, with too small a quantity of hydric sulphide to be determined by ordinary methods. These results show the air of the building, at the above date, to *be free from contamination by gases from the shafts*, since the quantities of ammonia and hydric sulphide found in the rooms are within the limits to be expected in the city atmosphere, while the quantities found within the shafts prove that the air passing out of them was contaminated with the gases from the closets. This fact was also apparent from the odor noticed within the shaft.

To ascertain and compare the efficiency of ventilation of the three buildings mentioned, samples of air were taken from the different rooms in the High School on the afternoon of April 26, soon after the pupils had left the building; between 11 and 12 o'clock of the morning of May 1, while the rooms were occupied; at the Outhwaite and Waring buildings between 3 and 4 o'clock of the afternoons of May 3 and 7 respectively, just before the schools closed for the day. In these samples carbonic dioxide was determined with the following results, as parts per 10,000 by volume:

Carbonic dioxide (parts per 10,000), Central High School, tests of April 26: Room 3, 9.1 parts; room 6, 11.1 parts; room 11, 6.1 parts; room 12, 10.4 parts; room 15, 14.5 parts; room 16, 7.8 parts; room 17, 9.9 parts; room 18, 6.6 parts; basement, 17.3 parts; outside of building, 4.5 parts.

Tests of May 1, same building: Room 4, 8.4 parts; room 6, 12.5 parts; room 9, 7.0 parts; room 12, 7.7 parts; room 18, 11.7 parts; room 16, 10.5 parts; assembly room, 7.6 parts; basement, 8.7 parts; closet, 5.9 parts.

Outhwaite School, tests of May 3: Room 1, 13.0 parts; room 5, 9.4 parts; room 6, 15.0 parts; room 7, 13.0 parts; room 8, 9.1 parts; room 10, 8.3 parts; room 14, 12.4 parts; room 16, 14.9 parts; room 17, 13.7 parts; basement, 6.3 parts.

Waring School, tests of May 4: Room 2, 9.1 parts; room 3, 8.4 parts; room 4, 9.8 parts; room 5, 9.2 parts; room 6, 7.8 parts; room 7, 9.9 parts; room 8, 8.7 parts; room 10, 6.3 parts; basement, 7.1 parts.

Normal air of the city contains from 3.0 to 4.0 parts of carbonic dioxide in ten thousand parts, and according to the best authorities, air containing above 7 parts as the results of respiration, is unfit for this purpose and detrimental to health. The condition of air in the Central High School and Outhwaite buildings must, therefore, be regarded as indicating insufficient ventilation. (These two buildings do *not* have the Smead system of ventilation.)

AN HYGIENIC PROBLEM.

In the advancement which has been made in modern architecture, it is apparent to those who have knowledge upon the subject that equal progress has not been attained to in the matter of a solution of the all-important hygienic problem. It is stated, for instance, that the sewerage constructions in the most famous of architectural monuments in the world are defective, and that to this more than to any natural causes may be attributed the fearful death rate, which at certain times prevails to the horror and mystery of the whole world. That much advance has been made in the past century is not to be denied, and, in fact, it might be stated with much truth, that even now more than half the battle is won; but this problem is an ever-recurring one. The advance of civilization brings with it new features, and adds at times vexatious problems for solution. And

this subject has been under discussion since medical science first secured a foothold, independent of the state and free from the dogmatic surveillance of the church.

One of the most talented of French writers, Victor Hugo, in the *Les Miserables*, called attention to the wealth which underlies the city of Paris, in its sewers, and stated with that emphasis ringing with the power of thought which surrounds all of that great writer's works, that because of an almost criminal thoughtlessness on the part of the scientific men of his country, all that wealth was daily being swept away into the sea.

It is very possible that in America, the time is not far distant when the truth of Victor Hugo's remarks will find practical demonstration in the direction which those authorities upon hygienic or sanitary engineering are tending, in the solution of the problem of the disposal of sewage, according to the recent acceptance of that term.

Quite recently the subject of dry closets, as an hygienic substitution for the prevailing system of water closets, has had much and increasing attention. And in its favor it may be stated that after thorough examination, it has gained the endorsement of a large portion of the medical profession, and for that matter, the more who observe this system of dry closets, the larger favor does it attain to. A medical authority, in a centrally located city of the United States, has given his opinion that the system of dry closets, to which his attention was recently called, was far superior to any system of water closets extant, and that the system under discussion was based upon approved scientific principles. As explained in a recent interview, this system is dependent upon a principal of construction which absolutely prevents fermentative or putrefactive changes in the contents of the vault constructed according to the specifications required, and thus obviates any theoretical danger of poisonous emanations therefrom.

It is an accepted theory that disease in most cases springs from the prevalence of noxious gases arising from defective sewerage and imperfect drainage. It is also supposed that the relation of disease to the noxious gases is through the development of germs. Whatever may be the causes, and of whatever infinitesimal nature, it is generally admitted that decomposition is always to be found at the base. *Now, the system of dry closets above referred to does away entirely with decomposition. Remove the cause and the disease will disappear.*

The results are subjected to currents of warm air, which *dries up at once all its contents*, and at stated times *the residue is subjected to a quick combustion*, which reduces all matter to nothing, that is, to an *inodorous, harmless, diffusive gas, which arises and is dispelled in the air*. In conclusion, the medical authority above referred to states that such a system prevents putrefactive changes in the matter and dispels the gases as they arise in the air.

"Conceive," says he, "of the emanations of this city of 250,000 people passing into the air, and with them the emanations from the vast number of animals of all kinds here and from their excreta! How inappreciable in comparison are the emanations from the 1,000 pupils of the High School, which through a beneficent plan of the diffusion of gases by and through the atmosphere, are rendered harmless. Contrast, then, the accumulations of organic matter in water, whether standing or running, which are much more liable to discharge noxious gas into the air in pent up places, while they should be afforded the most free diffusion. I have no doubt that the dangers are very much greater with a system of confining in sewers than with this method. I am so impressed with it that I should much prefer to have a system of that kind in my house than any system of water closets I now have, and I have the best that could be obtained at the time. I give this as my free will opinion in the interests of the public health and of sanitary science."—*American Artisan*.

HEATING, VENTILATING AND DRY CLOSETS.

A PAPER READ BEFORE THE STATE HOMEOPATHIC MEDICAL SOCIETY, AT CINCINNATI, O., MAY 14, 1889, by J. W. CLEMMER, M. D., COLUMBUS, O.

The hygiene of public buildings is defective. This applies especially to heating and ventilation. In any city one can observe a lack of scientific exactness in this matter. Natural law is ignored. Health considerations are lost in the aesthetic effect of the architect or in the stupidity of the engineer. Many halls, theaters, churches, court houses and other public buildings are heated without any means of ventilation excepting that by opening the windows and doors. Under pretense of ventilating others, the architect has made vents high up in the wall or ceiling, presumably for the escape of foul air. The result is, the pure, warm air escapes by these means, while the cold, foul air, being of greater specific gravity, descends to the floor. Let it be fixed in mind and in practice that air ducts intended for the escape of cold, foul air, if not placed near the floor, will serve the interests of the coal dealer alone, and rob the innocent occupant of both health and comfort.

Another mistake you will find, as I have, in visiting public buildings, that foul air registers lead to conduits that return the cold, foul air to the furnace, to be re-heated and returned again to the room. It is observed, too, that cold, foul air flues in the same room with grate fires are incompatible. By causing draft in the grate flue the air pressure in the foul air ducts is lessened and its contents are returned to the room, thus the order of air circulation is reversed. It is also found that the cold air inlet is too small, or made to pass the air over coal, rubbish and dust heaps, thus fouling it before it reaches the heaters. All sorts of failure may be observed. In very cold weather there is often an inadequate amount of heat furnished. Schools and other assemblies have to be dismissed or punished with a cold temperature. More frequently there is a lack of ventilation. In fact, as a rule, the heating and ventilation of public buildings are horrible.

Who is responsible? Surely not the school girl, or the church member, or the theater goer. The people are not responsible. *The architect, the engineer and the physician are responsible.* The mechanical artisan plumes himself upon the elegance and beauty of his work. He pleases the owner and the public with a structure whose exterior is the expression of perfect symmetry and form, whose interior bespeaks the embellishment of art and refinement, but alas! whose sanitary effect is lost in neglect, discomfort and impaired health. The physician, like the supreme judge, renders final decision. The sanitary arrangement of buildings requires his approval. It is his business to decide in matters of health, and it becomes his duty to aid the architect, plumber, builder and engineer to construct sanitary houses.

The union of scientific fact to mechanical art is the basis upon which rests the hygiene of public buildings. The physiology of respiration is no less a factor in a system of heating and ventilation than the construction of flues or the payment of costs. Indeed, a knowledge of the requirements of physiological existence is the prime factor, whose importance outranks the blandishments of art. A knowledge of the atmosphere and of pneumatic law should be built in the heating and ventilating apparatus. The behavior of the atmosphere under varying conditions of temperature, moisture, contamination, high winds and local environments must be understood and respected by

the engineer. A perfect system stands as an index to both scientific knowledge and mechanical skill. Every surgical instrument expresses this fact. Living rooms, like the instrument, in the hands of art, should be fashioned at the dictation of science. In this way, school rooms, for instance, would be so constructed and ventilated that the normal proportion of carbonic acid in the atmosphere (4 parts in 10,000) would not, during occupation, reach the danger line at 7 or 8 in 10,000. To keep within safe limits, it is found, upon good authority and experiment, that man requires 40 cubic feet of fresh air every minute. This requirement presumes continuous habitation without opportunity for frequent airings, as in the case of public buildings. Dr. Billings says: "For schools the allowance of from 25 to 30 cubic feet per minute and head will answer all needful purposes." With such an amount of air to be supplied so rapidly it is evident that the size of the room and the number of occupants become important considerations. Unfortunately authorities differ as to the amount of air space that should be allowed to each occupant of the room. An average of six authorities places the figure at 240 cubic feet. In order that a school room may not be too large for lighting, disciplining and teaching, the number of pupils should not exceed 55 or 60.

From these general, hasty considerations, ventilation begins to assert its claims and to formulate the conditions upon which it is to be secured. Slowly a definition of the subject unfolds itself. Ventilation may be defined to be a constant admission of pure air to a room with an equalizing temperature, the difference in temperature not to exceed 10 degrees Fahr. in different parts of the room, to displace the foul air which is as constantly exhausted from the building without appreciable draft, yet sufficiently rapid to renew all the air in the room in from 10 to 30 minutes, according to the size of the air space and the number of occupants.

In public buildings, grates and stoves or any other means of furnishing heat by direct radiation alone must be abandoned, because there is not an equalization of temperature in all parts of the room. The supply of heat is irregular and inadequate. Besides, these means oppose the principle of perfect ventilation. Furnaces of various kinds and in endless variety that pall upon the market, bespeak their own opposition and confusion, in principle and practice. Some afford no ventilation except by opening windows, others are used with an insufficient pure air supply; others do not admit fresh air directly from the outside, but depend upon cellar air, which is more or less contaminated by fouling sources.

In the introduction of furnaces, many are adjusted according to a stereotyped method of conduits, flues and pipes, regardless of the size, number or elevation of the rooms to be heated. In many, the requirements of physiological living and the necessity of renewed air at a certain temperature are conditions not supplied.

On account of a lack of sufficient ventilation, emanations from the body, and, in a mixed audience, the malodorous compound gas of neglected "catarrh," tuberculous and other diseases, bad whiskey and decayed teeth, hang about public rooms as gods of evil to mock the intelligence of the jurist, the divine and the teacher, and to indicate injured innocence in acts of commission by culpable architects and "furnace men," and the sins of omission by the sanitarian.

As an index to the worth of heating and ventilating apparatus in general use, I quote the language of Dr. R. Harvey Reed, of Mansfield, from a reported investigation of the school buildings and churches of that city. These are all heated by furnaces of various kinds, excepting one heated by steam. He says: "I have examined fifteen churches and nine school houses, every one of which I visited in person, from cellar to the garret, and examined carefully their systems of heating and ventilating, and when necessary actually tested the drafts and currents of air by proper methods, to satisfy myself of their exact course; and whilst a few of them are fair, I have failed to find a single one complete and the majority of them are simply horrible!"

These observations corroborate those made with respect to some of the public buildings in Columbus. My examinations and information produce the conviction that the ordinary methods of

heating and ventilating public buildings are very imperfect, that the majority of apparatus, both furnace and steam, in present use, fail to reach a standard of perfection required by both health and comfort.

Steam heating for large buildings is popular. With a low pressure and the direct-indirect radiation, this mode of *warming* is satisfactory. Still, steam apparatus has an element of danger; it is expensive and requires skillful engineering to insure satisfaction. The cost for repairs is considerable. For the purpose of perfect ventilation exhaust fans must be attached. The government building at Columbus, the School of Technology in Boston, and many other structures are thus heated and properly ventilated.

What is wanted, especially in meeting the demands of a rapidly increasing school life, is an apparatus that will heat the largest building in the coldest weather, and guarantee perfect ventilation, at a moderate cost. It must supply the conditions already indicated: (1) regulation and uniformity of temperature throughout the room and building; (2) abundance of pure air for every person, and (3) prompt removal of foul air from each room.

The Smead system of heating and ventilation supplies these conditions and meets all requirements. The pure air supply is brought in through a basement window, always open, to the cold air room, always clean, in which is located the heating apparatus or air warmers. These furnaces differ from all others in being constructed upon principles founded in the engine boiler, which presents the largest amount of heated surface. The heat generated in the fire box, together with the flame, smoke and other heated products of combustion, instead of passing more or less directly to the smoke flue, as in other furnaces, is held as long as possible. The heat, flame, etc., are made to return to the front of the air warmer (furnace) through twelve iron tubes immediately above the fire box; thence they are again returned to the rear, through a large flue, to the smoke stack. Economy of fuel finds explanation in the character of the warmer in presenting a large amount of fire surface, which means surface with fire inside. The whole is encased in masonry work with cold air inlets at the bottom, and, at the top, the hot air chambers are mounted with brick flues to conduct the pure, warm air to the rooms above through registers. Above each register is the "regulator," which is a ratchet crank moving over a dial marked "warm air" and "cold air." When the crank is moved to the right, pure, cold air from the fresh air room in the basement is admitted to the room; when turned to the left, pure, warm air is admitted, and from the same source, only it is made to pass over the tubular heaters. The regulation of temperature to any degree is by means of a valve at the bottom of the air flue near the heater, so arranged as to give vent to either warm air or cold air, and by means of a chain put in command at the regulator. It is possible to regulate the temperature of the air admitted to the room, but it is impossible to cut off the circulation of pure air into the room, or to impede its ventilation. Despite the carelessness or preoccupation of the teacher, the supply of pure air is constant and irresistible. The foul air is taken out through a number of registers (6 inches by 3 or 4 feet) located around the room in the baseboard. The sum of the vent areas is more than that of the warm air register, a requisition often disregarded.

Vent shafts at convenient points in relation to the rooms are erected, large enough to carry on the circulation of the building and tall enough to extend beyond the cone of the roof, in order to avoid temporary embarrassment to the outflow during high winds. At the base of each of these shafts or stacks is placed a small furnace, the "stack heater," to secure draft.

It becomes plain, now, to see how the foul air in the room is to find vent. After being drawn out at the baseboards, the foul but partially warmed air is made to pass under the floor and to traverse this enclosed space between the floor and ceiling in all directions by means of furred strips over the joists. In its passage the floor and feet of the occupants are kept warm, thus meeting the injunction of professional advice, "Keep your feet dry and warm." After the escaping air serves such good purpose, it is conducted to one corner of the room, where it enters the vent shaft

on its way out at the top of the shaft. This circulation beginning with the great ocean of atmospheric air through the cold air room, over warmers into flues, into rooms and halls, beneath floors and out the stack, back to space, is like the great circulation of waters in nature, beginning with absorption from the ocean, followed by saturation, condensation, cloud formation, precipitation, in the endless round of rain, river and its return to old ocean.

"The Smead system of dry closets" is a newly discovered star in the firmament of sanitary science. It is not a necessary part of the Smead system of heating and ventilation. Each may be adjusted to a building without the other. Together they complement each other. When the dry closets are added, the course of the foul air on its way out of the building is changed. The exhaust air from every room in the building is taken downward at convenient points (under the floor), all sources being drawn to the foul air gathering room (in the basement), in which is placed at one end a trench over which the closet seats are placed. At the other end of the trench, or vault, is erected the vent shaft or foul air stack. The closet trench is nothing but a horizontal section of the shaft. At the base of the stack, remember, is placed the stack heater. The vault is about four feet wide and four feet deep, and as long as seating capacity may require. It is lined with brick and the seats with sheet iron, making the vault fire proof. The floor of the vault rests upon iron cross bars. Beneath this is an interspace of a few inches overlying a bed of gravel. The brick floor upon which the excreta are deposited, as well as the gravelly sub-strata, will absorb an excess of liquid matter pending its removal by the currents of air through and under the vault on its way to the stack from the foul air room. A urinal is also attached, with the same relation to the vault as the seats. The floor near the urinal and seats is made of perforated iron, to provide for the inward draft.

The two systems are outlined. With this picture of a building that is intended to breathe, to do its own plumbing and drainage, to dispense with the services of the "night cart" and all its associate evils, to place the hygiene of public buildings so far in advance of present methods that it would appear to stand matchless in its approach to Eutopian perfection, the Goddess Hygiea is consulted to learn if these things are true in practice as in tautology. These were the thoughts that *induced me to investigate*, with a determination to either *oppose* or *attack* according to conviction. This system is being introduced into many public buildings through the country, and it becomes our duty, as physicians, to investigate its sanitary effect, especially on school life.

Time will not permit of details. The history and literature of the subject bristle with reports of investigating committees, chemists and sanitarians. I will glean a few statements from these sources and from personal examinations and tests. Besides, you are invited to investigate for yourself. The work, like a model, invites inspection. You will find that 2,000 cubic feet of air every hour is afforded every occupant; that rooms are kept at a uniform temperature in the coldest weather; that the temperature of the room at floor and ceiling does not vary more than 6 to 8 degrees; that the air is exchanged every 10 to 20 minutes; that the exhaust at the top of the vent stack, as determined by the air meter, equals the amount of the pure air at the registers. In heating the room the thermometer will show, under proper conditions, an increase of temperature of two degrees per minute, indicating that the work of the warmers is rapid and very satisfactory on a cold morning. Again, oil of peppermint scattered in the fresh air room, in two minutes is detected in the foul air gathering room, showing how rapidly air makes a complete circuit of the building.

One of the School Board committee of East Saginaw, Mich., reported: "By using a delicately adjusted air meter, we observed the supply of fresh, warm air was sufficient to fill the room every 12 minutes. By applying the same means to the ventilating stacks in the base, the outflow of vitiated air corresponded in quantity to the supply of fresh air. The same test applied to the closet vaults, showed 350,000 cubic feet to pass every hour, which at 80 per cent. relative humidity, is capable of taking up about five gallons of liquid matter every hour. Five-sixths of the excreta are

liquid constituents. Upon scientific principles it is shown that the dry closet will do all that is claimed for it. But it is not necessary to depend upon theory when practice demonstrates the fact."

My visits to the Columbus schools corroborated the statements of others. In each case the closet room was absolutely odorless. Upon raising a seat lid a strong down current was found, sufficient to draw out a lighted match and a tallow candle. The fecal matter was thoroughly dry. It was impossible to get bad odor, even at the seat. The vaults are cleaned by combustion *in situ*. The residue of a winter's dejecta can be burned easily, leaving only the ashes to be swept out by the janitor.

The Columbus School Board are highly pleased with the system, and are giving it place in all new buildings and in some of the old. In their last annual report reference to expense for coal is made: "Average tons to room—Steam, 10; Smead, 6." In ten years, seven buildings heated by steam cost nearly \$11,000 for repairs, while the Smead guarantees no costs for repairs for first ten years.

In my researches I found no trouble or complaint with the heating and ventilating apparatus. This seems to be faultless.

The dry closet system in Cleveland, in the Central High School building, did not work well for a time, until certain corrections were made in a *faulty adjustment of the system*. The gullibility of the people and their ignorance of technical matters paved the way to a *newspaper sensation* causing public excitement and remonstrance, under the pressure of which the Board of Health issued an edict of extermination which, at this writing, is trembling in the balance of execution before the Board of Education. *In my judgment, this sanitary board, in condemning the dry closets, is making a record that will bring reproach to itself in the near future.*

The Annals of Hygiene, the official organ of the State Board of Health of Pennsylvania, in its April number of the current year, contained an article describing the dry closet system. In the May number is found an editorial upon the same subject. Extracts only can be given. The article in the April number created comment. Among others, an Ohio physician writes, "because of a newspaper publication condemning the system which he desired to have verified or disproven." It is claimed that the gases of decomposition from the vent stack cause disease. The editor says: "Before deciding to describe this system in our pages we made a most critical examination of its working qualities and then set to work to try to find fault therewith." He goes on to explode the theory of contamination. He wrote to physicians in localities of the dry closets, and says: "In no instance does the experience of scientific men give a shadow of support to this unfounded newspaper representation." One of the editor's correspondents reports that the closets were introduced into all the school buildings of his city, and says: "I have examined them repeatedly and never found one that allowed the faintest odor to get out into the building. *This is the only system of inside closets with such a record.*"

The editor gives no names, and, after disclaiming any interest outside the interest of humanity, says of the dry closet system: "It is, we believe, a great step in sanitary progress and we are anxious to give it all the publicity possible."

Dr. H. J. Herrick, of Cleveland, a prominent physician and sanitarian, is on record favoring the dry closet system. He regards it "far superior to any water closet. The drying out process prevents the fermentation or putrefactive changes which would induce the generation of noxious gases." Again he says: "The atmosphere has a very much greater capacity for destroying and diffusing noxious germs or noxious gases than water."

The objection urged that the surrounding atmosphere is fouled by ejections of noxious gases in the dry closet system is empty cavil. Grant it is an evil. The same system of ventilating sewers, house drains, and soil pipes obtains in the sewerage system. The soil pipe is extended through the roof for the purpose of ventilation. The foulest and most dangerous section of the

sewerage system is in the dwelling. Sewer gas under air pressure in the sewer, will bubble up through the trap water. Traps may be syphoned. Ventilation is often defective; plumbing may be bad. In order to avoid sewer gas by its diffusion and dilution with the atmosphere, the whole sewer is ventilated. *Sewer gas is taken out at every gutter drop and manhole along the trunk sewer, and out at every soil pipe in every plumbed house, thus creating thousands of short vent stacks in every city to discharge noxious gases and bacteria.* No one is foolish enough to attempt a sensation in which is pictured bacteria and death germs, as large as bats, flowing through these vents to decimate an unsuspecting populace.

Why should the dry closet be attacked? Three hundred and fifty thousand cubic feet of air passing through its vault every hour insures perfect ventilation, as compared to the dangerous imperfections of plumbing. Besides the dry closet does not tolerate putrefaction and decomposition of organic matter in foul, slimy, damp places as culture beds for disease germs. The desiccation of excreta, with the prompt removal of its liquid portions (5-6ths) into regions of atmospheric dilution, *is nature's own method.* The chemistry of the sun and vegetation in the great laboratory of nature, provides for the disposal of noxious gases. Oxygen is the scavenger of nature whose products, ammonia and carbonic acid are appropriated by plant life.

All I ask of any closet system is the complete removal of both liquids and solids from the building with no trace of malodor of its dangerous presence in living apartments. We all know what the old fashioned vault is, what the reeking latrine is, what plumbing is. They do not meet these conditions satisfactorily. Then let the dry closet system, which is not opposed by its own defects, but by the *irrational dread of innovation*, be treated with *fairness and reason.* Foisting upon it the same objections that are placed against the system in prevalent use, is manifestly unfair, and hobbles its merits. Like all progressive ideas, this is opposed in its infancy only to stimulate its worth and growth. Despite its invective abuse its supremacy in school buildings is already established.

FROM REPORT OF COMMISSIONERS, DISTRICT OF COLUMBIA, FOR 1888.

* * * * The above expenditure includes amount paid to Isaac D. Smead, under contract No. 841 for the introduction and construction of the dry closet system in the Peabody, Garnett, Abbott and Henry School buildings—\$3,879.30.

The appropriation was applied to the removal of the water closets from the basements of the Peabody, Garnett, Henry, Abbott, Force and Franklin. At the first four named the Smead dry closet system was constructed.

The dry closet system, as placed in the old and new buildings, *has proved a great success.* In the twelve-room buildings occupied during the year, with an average of 600, and the eight-room buildings, with an average of 400 pupils, the evaporation so far consumed the excrement that, at the closing of the school year when they were *burned out*, nothing remained but a small quantity of ashes, and at no time has there been any cause of complaint.

The system is an economical arrangement, both in first cost and constant use, as they are not liable to become impaired to any extent and repairs to them can at no time be extensive or expensive.

THOMAS B. ENTWISTLE,
Inspector of Buildings, District of Columbia.

ON VENTILATION, BY W. B. POWELL.

The school rooms that have been provided during the last ten or more years are cheerful, *thoroughly ventilated, and healthful.* I am glad to be able to say the system of ventilation employed ventilates, *and ventilates in spite of the preoccupation of the teacher or of the janitor.* In

respect of heating, lighting and ventilation, nothing more is to be desired in the new buildings. Some of our older buildings, however, although fine, imposing structures, are poorly ventilated or not ventilated at all. The more prominent of the former are the Franklin and the Jefferson; of the latter, the Wallach and the Cranch. Nothing, to my mind, should be urged more strongly, save only additional accommodations, than the improvement of the ventilating processes in the buildings named and in a few others. So easily may this be done, and at such a trifling expense comparatively, with the knowledge now possessed, that I should feel myself remiss did I fail to call your attention to this most urgent need and thus emphasize the suggestions of my co-laborers.

W. B. POWELL,
Superintendent of Schools, District of Columbia.

SANITARY CONDITION OF PUBLIC SCHOOLS.

The sanitary condition of our public schools has been greatly improved since the recommendations in my previous report have been carried out, as far as the appropriation made by Congress would permit. Another appropriation, however, is needed to reconstruct the yard closets and the apartments in which they are located belonging to some of the old school houses. The Smead dry closet system having been adopted by the commissioners and introduced in twenty school buildings, it may be proper for me to give some explanation of the practical workings of this system, as it is now in use in connection with Smead's system of heating and ventilation.

"Fresh air from out of doors is supplied in such quantities as may be desired, which is heated by furnaces and passes through various flues into each school room. The same volume of air enters the room constantly and the proportion of warm and cold can be regulated by the teacher according to the requirements. After circulating through the room, it passes out through grated openings which are placed at short intervals in the baseboards on the outer boundaries of the room. This warm air then passes under the floor, heating it sufficiently to warm the feet, and is carried to the foul air room in the basement. From thence it is drawn, by way of arched openings in the brick wall, through the privy vaults, beneath the seats, to the brick foul air chimney, whence it escapes into the open air. *The philosophy of the arrangement is exceedingly simple.* This current is created by the natural disposition of heated air to rise, and the draught thus produced in the stack is amply sufficient for the purpose. For use in summer, a small heater is built in the wall at the base of the stack, and when the draught is not sufficiently strong without it (as perhaps on damp, muggy days), a fire may be quickly kindled here, and the hot air rising through the stack at once stimulates the draught to any required extent."

I have examined these closets under all circumstances and conditions since they have been in use, and I find them at all times working satisfactorily, the air in the rooms being purer than where plumbing fixtures are used.

SAMUEL A. ROBINSON,
Superintendent of Plumbing, District of Columbia.

CONSIDERING THE SMEAD DRY CLOSET SYSTEM.

PROCEEDINGS OF A MEETING OF THE BOARD OF EDUCATION OF CLEVELAND, OHIO, MONDAY
EVENING, MAY 6TH, 1889, ON THAT SUBJECT.

During the discussion, by the members of the Board of Education, upon the subject of the removal of the closets, the opinion seemed to be general that it was advisable to discontinue their use, although not one member sustained the charges made by the *Leader*. Mr. Zucker (ex-president), who was most prominent in the matter, said :

* * * * Now, Mr. Chairman, I will say this, and I say it deliberately, if I did not believe there had been but a single case of sickness resulting from the introduction of the Smead system, yet would I heartily vote in favor of the resolution I have introduced. If I thought there had been only one case of sickness, if I thought it would stop one further case of sickness I would vote for it. I would do that, Mr. President, on this principle : We are legislating on this subject for the *people* ; we are spending the money of the *people* ; the whole *people*, the city of Cleveland, are not immediately interested there ; are only interested so far as their children go there. But when those parents that have pupils attending the school, and still more these people who have little children living in houses in the immediate neighborhood, *are panic stricken on account of this matter*, it is our manifest duty to do all we can to allay that panic and stop that fear to prevent that sickness. I am no physician, but I know this, that the *fear and dread* of sickness, especially with a child, is often more harmful than the sickness itself, nay, is the direct cause of sickness. I appeal to you as physicians if I am not stating a fact. I am told that to-day there are between two and three hundred absentees from that school, and those who are there are only kept by sheer moral force ; that there is a panic and demoralization existing among the pupils that do attend that utterly destroys the efficiency of the entire school. I could stop right here and say further comment is unnecessary. That is enough in itself.

Mr. Chairmen, I am told by reputable citizens living in that neighborhood, people whose character I know is as high as the highest among us, that there *is* a large amount of sickness in that neighborhood.

Now, I want to pause right here. I have to-night on this floor noticed the public prints more than I have in many years. I do not know of anything that has ever come before us that has so engrossed public attention, that so comes to the home of every citizen as this. In the *Plain Dealer* of to-day I find an interview with a physician of reputable standing (Dr. Herrick). That interview is very scientific. It reminds, me Mr. President, very much of the sixty-nine reasons the young attorney gave his client to prove that they could not put him in jail. After he got through, the fellow says, "But hang it all, I am in jail." And Dr. Herrick's interview reminds me of that story. He gives sixty-nine cogent reasons why it is not the cause of sickness. But hang it all, there is sickness. So much for that interview. Again, it strikes me as very singular that that scientific reporter had all his scientific questions so scientifically laid out. It appears to me, Mr. Chairman, more as an argument than as a scientific statement. But I, for one, in the face of the facts that a body of well known citizens have adopted a resolution and made certain requests and demands on

us, as they have a right to do, because we are only their servants, the servants of the citizens generally—I say, in the face of such action, *I shall pay no attention to this scientific discussion, so scientifically laid down in this newspaper, which newspaper, in its editorial columns, has called upon the Board of Education to root out the evil—the Smead system—body and soul.*

Mr. Morris: Mr. Chairman, being a new member of this Board of Education, realizing fully the vast importance of this question, some three weeks ago I set myself diligently about investigating, as best I might, the various complaints, going to the scholars of the schools, who had left the schools and who were still attending, going to the schools that had the Smead system and going to the schools that had not the Smead system in, but the water system and outside closets, and in every available way that I knew of or could think of, tried to inform myself as to the merits of the complaints made. I coincide with Mr. Zucker's views to a very large extent. There is no question in my judgment but what something must be done at the Central High School. *What that something is, it seems to me, is a very wide question.* I cannot, under my present understanding of the facts, endorse outside closets, as we have them now.

I find that by going to the Sterling Avenue School, *we have an odor there that surpasses anything you could imagine as connected with any one of the Smead system of closets in the city.* We go to Brownell and we find the same facts existing—*outside closets there—that the neighbors condemn and say that it is unbearable at times for them to stand the stench from them.* I read in the *Leader* of last Saturday that the sanitary condition of the Walton Avenue building is very bad. The closets are in the basement of the building and very near several of the recitation rooms; *that the stench is at times unbearable,* but the teachers have been unable to cause the Board of Education to take action in the matter. This is a water closet system school, to be sure, not an outside system, but a mere water closet system. But I find that it is no worse by going there than the system at Sterling or at Brownell.

Now, while I endorse largely Mr. Zucker's remark, I want to say that I had an interview to-day with a gentleman who has been quoted as condemning this system, and *he told me himself that he could not charge it to the Smead system, although he felt as though he had to.* I have interviewed many citizens. I went along Arlington street, and saw very many people there. I found none, in fact, who said that he had ever perceived a disagreeable odor from the Central High School. One of this committee of ten told me in person that he and his wife had never smelled a bad or disagreeable smell from the Central High School. A young lady of sixteen, an attendant at the High School, was at our house to dinner this last week, and told me in person that she left the school *because her mother was scared.* I asked her the question, if she ever smelled disagreeable odors in her room. She said no. I asked her why she left school. She said she left the school because her mother was scared. I asked her if she ever discovered disagreeable odors *before the Smead system was put in.* She said *yes, she had, but she considered the Smead system an improvement over the old method.*

Now, in view of those facts, I am not ready to take immediate action on removing this whole system out of the school. But I am informed by men of judgment, men who are versed in this business, that there is an addition that we can make for the system we have there which will be perfectly sanitary, and I offer it as an amendment to a part of the resolution which is now before us. It is an amendment to that portion of the resolution pertaining to the construction of temporary closets, and if adopted we may then act in the future by putting up either outside closets or any method that may be found to be most judicious.

The clerk then read the resolution of Mr. Morris.

By Mr. Morris: To amend the resolution of Mr. Zucker, that Superintendent of Buildings Wright is instructed to immediately provide receiving troughs under the seats of the closets at the Central High School, which shall be provided with running water and connected with the city sewers, thereby carrying off at once the excrement into the city sewers—without disturbing the

ventilating part of the closets, and to strike out that part of Mr. Zucker's resolution that relates to closets being erected outside of the building."

The Chairman: It is moved that the amendment just read be adopted, with a motion also to strike out a part of the original resolution. Are there any remarks?

Mr. Bemis: I am opposed to that amendment. I do not wish to vote in favor of a closet system of that kind, even temporarily, in our High School building or in any building. I would prefer seeing such closets outside the building. If we are to have temporary closets made, I would prefer that they should be made outside the building, as is provided for in the original resolution, and that is the reason I shall vote against the amendment.

Dr. Smith: Mr. Chairman, this is a question which interests us all, and we are desirous of getting all the light we can upon the subject. The gentleman who first spoke referred at some length to arguments of Dr. Herrick.

Now, I feel like rising to a defense of Dr. Herrick. *Dr. Herrick is a Professor of Hygiene*, in the Medical Department of the Western Reserve University, and has been for years. He is a *man who is recognized as authority upon sanitary matters*. He has given, in that interview that was published in the *Plain Dealer* this morning, his candid opinion, and Dr. Herrick is here to-night. I should be very much in favor of asking him to say a few words to the Board, if he will. It might, perhaps, assist us in knowing just what disposition to make of this matter. I move that Dr. Herrick be asked to make a few remarks to us on this subject.

The Chairman: It is moved and seconded that Dr. Herrick be requested to take the floor and make some remarks on the question.

Mr. Zucker: Mr. Chairman, I object. My objection is this: Dr. Herrick has already taken sides. Dr. Herrick's opinion is already well known. Or, are we to understand that Dr. Herrick has changed his opinion since this morning, or will he give us additional reasons why he believes as he does? That is all he can do. I would suggest that copies of the *Plain Dealer* be procured and distributed for the purpose of making known his opinion. Why not ask every citizen who has come here from the vicinity of the High School to come upon this floor and give us his opinion as to whether the health and lives of the people in that vicinity are in danger or not? I do not believe we want these outside opinions.

Why, Mr. Chairman, the same plan was proceeded with when they first shoved this system onto us. They wanted more time. They deluged us with books and pamphlets in favor of the Smead system.

Now, Dr. Herrick's reputation is not going to be hurt by my little say. I object to a physician who has taken one side of a case, who has put himself in a public print in a lengthy interview in order to help that side, being allowed to come on this floor, as an outside member or a member of the Twenty-first District, to instruct us how to vote. I shall object to hearing from the gentleman.

The Chairman: Is there anything further on this question? All in favor of the motion will signify it by saying aye.

Mr. Felton: I desire to explain my vote. I wish, in the first place, to say that I am entirely displeased with the turn matters are taking here. The gentleman took the floor and assumed an air of candor, proposes to address his neighbors as honest, honorable gentlemen, having convictions like themselves——

The Chairman: The gentleman is out of order.

Mr. Felton: I will endeavor to keep in order. I have no objection to hearing from Dr. Herrick in this connection, except for the reason that I agree with Mr. Zucker that it is not proper to call in outside parties, and although I would like to give Dr. Herrick, or any one else whose

name has been mentioned by this body, an opportunity to be heard, I shall, for the reason given, vote no.

Motion by Dr. Smith lost.

The Chairman : The question is now on the motion of Mr. Morris.

Mr. Parnely : I hope this amendment will not prevail. I was very glad to hear from the member of the Thirteenth the history of the proceedings by which the Smead system was put into the schools. I was very glad that he went into no scientific discussion of the relative merits of the Smead or any other system ; and that he read then and we have heard the remonstrance of the citizens in the neighborhood of the Central High School. We have heard and know of very many cases of sickness up there and that there is a very general feeling against it, *and that this Smead system has caused much of this sickness.* Now, we should respect the rights of citizens ; we should respect the rights of people who live in the vicinity of the Central High School. I do not think we should go into a discussion to-night of the relative merits of different systems. I hope that this amendment will not prevail. I believe that it is the best policy for the Board to take some steps to immediately take the Smead system out of the Central High School.

Mr. Morris : Perhaps, in further explanation of my amendment, I should add a word or two to what I have said. I may not be fully understood. I am told by those who claim to be expert in the matter that by the method I suggest we obtain the same result that we would to have the closets outside, and it is done at a great deal less expense, a great deal quicker, and the whole thing can be accomplished in at least two days, and at the same time accomplish what we desire—that is, obviate the evaporation into the atmosphere, by carrying off immediately, without deleterious effects, through the sewer ; this can be done, and then outside closets, as seems best, can be adopted afterwards, and these troughs can answer exactly the same purpose as closets on the outside.

Dr. O. B. Campbell : Mr. Chairman, it is a well known fact that we have a panic in the neighborhood of the Central High School, and as a practicing physician in the neighborhood I know something of the facts in regard to the sickness. *If we can allay the panic, we will to some extent allay the sickness.* It is a recognized fact that a scare unnerves a community and individuals that are prone to sickness. Now, I favor this amendment for the reason that it will take much less time to put in those troughs, and that action will certainly allay the panic and excitement, and will not stop our schools, and final and conclusive action can be taken later.

N. B. Wood : I believe we are speaking on the amendment. It has nothing to do with the main question. As I understand the amendment I am entirely opposed to it. I am opposed to putting in any troughs, or anything of the kind, as it will be only a source of greater annoyance than the present system, that is to say, if it be actually a damage. Any trough of that kind will clog up in spite of anything you can do, unless you have the Cuyahoga river going down it. I shall oppose it entirely.

James Wood : Mr. Chairman, this system of troughs is called by plumbers the Mott system, and it would not be much better than the system now there. It would take time. It is a trough under the closet which holds water. I suppose that is the intention of Mr. Morris, the water to run in there and into the sewer. The janitor is supposed to pull the plug out of the end of the trough and discharge it every so often, and the oftener the cleaner it is supposed to be kept. I am entirely opposed to that. I believe, if I am right, it has already been taken out of two or three schools in the city. It is a closet that is used in some cases out of doors where there is a building for it. Railroad companies use it at stations ; and when it is used entirely out of doors it is unhealthy, and it would be wrong to put it into any of our schools in the basement. I shall oppose it.

Mr. Gunzenhauser : I shall oppose the amendment for the same reason. We have that very system in the Walton School and we have taken it out of the Rockwell School for the reason that it is a failure.

Mr. Beman: Mr. Chairman, a single thought or two. It is suggested it will take more time and be more expensive to have temporary closets outside. Now, as I understand the original resolution the proposition is to build merely temporary closets. These will not be built with great expense. They certainly can be built in a very short time. Any mechanic will tell you that they can be built at very slight expense, as they are neither designed to be permanent nor ornamental. I would like to inquire what time it would take? Is the Superintendent of Buildings present?

Superintendent of Buildings: They can, no doubt, be built in four days, a temporary closet; it would be very temporary though. It is a question in my mind—we will have to build them under the laws of the Board of Health.

Mr. Zucker: If it is necessary we can put on a double force and build them. There is something more than money at stake. I am surprised that a new member should seek to dally with a matter of this kind; it is monstrous. It wants to be torn up—rooted out; and if the Smead people knew what was best for themselves they would voluntarily tear out these closets. I am surprised that any member should come to their rescue. As has been said by the member from the Third, this very system they now seek to have temporarily adopted has already been condemned by us in other buildings. We want the Smead system out of the school, and whatever you do after that take time to consider the matter of the system to be adopted. You are not going to allay the panic by the plan that is proposed by this amendment. We have already rooted out such a system from another school, finding it very bad. Even if you have to shut up the school for four days it is better than having any sickness; and the plan that meets the wishes of the patrons of the schools, the teachers, superintendent and all the neighborhood ought to be adopted, and that ought to be argument enough.

Mr. Morris: Mr. Chairman, I want the gentleman from the Thirteenth to understand that the *war members* of this Board have a right to their opinions, and my opinion is, that I can save, by my plan, two days time over his, and if we adopt the system proposed by the amendment we can allay this panic two days quicker than by his plan. If we adopt this plan I will guarantee that there shall not be one single bit of odor connected with the closets as long as the air is drawn up through those stacks, and if it is run off into the sewer there could not be anything deleterious pass into the atmosphere to annoy or injure the people in the neighborhood, and it will save time over the other plan of outside closets.

The Chairman: Are there any other remarks?

Mr. Wilbur: It seems very strange that at the Central High School we have these complaints. There are five or six other schools in the city where we have the Smead system and we hear no complaints from them. On the contrary we hear from people living in the vicinity of these schools that it is one of the best systems that was ever put into any school house. I want to say that before this system was adopted at all by the city board that it was put into the West Cleveland School, on Cherry street. That school is not far from where I live. A member of the West Cleveland Board, who is a steam fitter, and who goes around to different cities to put in steam apparatus in big hotels and school houses, recommended that system. He took me out there and showed it to me when they were putting it in. I followed it up pretty thoroughly at that time. I believed that it was the best system ever introduced, and I have had no occasion since then to change my mind. I think those people who live out in the vicinity of the Central High School are mistaken: that they have not investigated enough. I believe the matter ought to be put into the hands of competent doctors and chemists to investigate and report back to this board. I think we can make mistakes by throwing out that system without taking necessary precautions before we do it.

Mr. Felton: Mr. Chairman, I did not intend to say anything on this amendment. I am not in favor of it for the simple reason that I do not quite agree with the mover of the amendment, that it will allay the excitement in that region. I am fully convinced that the people in that vicinity are

so thoroughly aroused, and so earnest in their belief—and I have not a shadow of doubt as to their sincerity—that I believe that nothing will satisfy them but the removal of those closets ultimately. I should be opposed to any temporizing with the present closet. At the proper time I wish to say something on the main question. I may say at this time, however, somewhat in the line of thought of the gentleman just upon the floor, while I am not an advocate of this system, and do not care a continental whether it goes up or goes down, I am happy to be able to say, and I presume the gentleman who is the inventor of the patent is equally happy to say he does not know me, I never happened to meet him; I never received an introduction, as I know of, to himself or any of his agents. I claim nothing for my integrity. I do hope I have been laboring with this subject from beginning to end with an honest purpose; and I believe this is true of every member of the old board; and I now believe that every member of the new board, and I agree with my friend recently upon the floor that the new members of this board are about the size of the old men, about as competent to speak and defend themselves and their cause.

I did take some pains, though in the first place incidentally, to learn in reference to this West Cleveland High School, to which Mr. Wilbur refers, fully two years before I was called upon—without any expectation of ever being called upon—to act on this board on that question. I asked a friend of mine, instrumental in procuring the Smead system for that building, how he liked it. I knew nothing of it. He spoke in high praise of it. He said it worked admirably. He invited me to come out and see it. I never did.

On the strength of that testimony, given at that time, under such circumstances, when ultimately we came to vote here—I will say with all deference to the gentlemen who were upon the floor upon both sides I was not influenced one iota—I voted upon the strength of the information I obtained under such circumstances as could leave with me no doubt of its sincerity. I am aware of the fact—we are all aware of the fact—that there is a panic in the region of this High School; for a cause or causeless is not so much a question for us now to decide. I am satisfied that we cannot allay that panic or excitement there except by removing the cause. These gentlemen who have expressed themselves are sincere. I know they mean what they say. They sincerely feel and believe their families and themselves have been poisoned, and they are being poisoned, by reason of those surroundings—of the environment of the gases from that High School building.

I do not understand from the resolution or from the amendment that there is any attack on the one hand or that there is necessity of any defense on the other—any attack of the Smead system as such, or any defense of it. I do not stand here to either defend or assail. A little later I may have something to say on the main question. I think the system ought to be removed *for the time being, because the people in that vicinity desire it, right or wrong in their convictions. I feel that we must allay that panic.*

Mr. Stewart: Mr. Chairman, I was not aware that the plan proposed by the substitute had ever been experimented upon in any other building: but if it has been tried elsewhere and failed, there is no use of our experimenting any further with it. I think we are fully satisfied, from all the information we can gather from the papers and from citizens, that there is an extended disquiet in the neighborhood of that High School, not only among the citizens, but among the pupils. We are expected to do something for the people who are apprehensive for their lives, citizens and pupils, and I see nothing in this amendment that would restore quiet, or help to restore the people to their usual routine of life, and I think it ought not to be adopted, but that the original resolution is the proper one for us to adopt to-night.

Mr. Wilbur: I am informed that Mr. Smead is in the room, and as he is directly interested I think it would be no more than fair justice and right that he be heard. I will therefore move that he be permitted to take the floor five or ten minutes to address the board.

Mr. Zucker: Mr. Chairman, I object. We are not now seeking to introduce a system of closets or of heating in a new school building. We all know about the Smead system. As the

member from the Fifteenth has said, we are all acquainted with it, and most believe *that, for certain buildings, it is a good thing.* We have had all the explanation on the High School subject that we need. I thought that I had treated the inventor of this system perfectly fair in reading his long communication. We have got his ideas. The history explains itself. We know what has happened out there even better than he. He is not a citizen. What is he going to tell us. On the same principle and for the same reason that I object to hearing from a physician I object to hearing from the inventor. We are men. We have understanding enough and know enough of what has happened to judge of these things ourselves, without calling in outside opinions.

Mr. Wilbur : Mr. Chairman, my object in making that motion is this : To take out those closets and throw them outside is to injure Mr. Smead's business ; practically condemns that system in this city. That will be carried to other cities and hurt the business, whether it is right or wrong it matters not. As I said before, it is nothing more than just that he be given a chance to stand up before this board and explain that system, so that we will understand it. He can explain it better, perhaps, than anybody else. I hope the motion will prevail.

Mr. Morris : Mr. Chairman, in view of the fact that we are not dealing with the adoption of any system, it seems to me entirely out of place to bring into this board any one to defend it or speak against it. I certainly hope this motion will not prevail.

Dr. Smith : It seems to me it cannot do any harm to hear from Mr. Smead. We are the party of the one part and Mr. Smead is the party of the other part in this matter. We are both interested. He is as much interested as we are. I do not see that it is going to hurt us if we get a little more light on the subject. I am sure I do not feel like cutting off one side entirely, and not allow anybody to say anything except upon the side that I believe. I am sure I, for one, would be very glad to hear what Mr. Smead has to say.

Mr. O. B. Campbell : Mr. Chairman, I should like to hear Mr. Smead talk to us. He would be able to give us some ideas and suggestions. I do not think it is fair to shut him out and not allow him to say a word. I voted against Dr. Herrick speaking here because he had already given us his idea—what he thought. I don't think it is right to shut out Mr. Smead.

The motion to permit Mr. Smead to address the board was lost. The motion of Mr. Morris was also lost.

The Chairman : The question is now on the adoption of the original resolutions of Mr. Zucker.

Dr. Smith : Mr. Chairman, I desire to say a few words on this question, inasmuch as the history that has been read by the gentleman from the Thirteenth seems to have pointed very emphatically, in several instances, to me as having been instrumental, or one of the instruments, in introducing this system here. By way of preface I would like to go a little further back than the gentleman did and give some of the reasons why I was in favor of introducing this system, which I think may be interesting to some members of the board.

I have now been a member of the board some thirteen or fourteen years, and there has always been one question which has given us a great deal of trouble, and that is the question of sewerage connections with our schools, our closets and our urinals ; our closets and our urinals have given us the greatest amount of trouble. We have had complaints from school building after school building because they were not in satisfactory condition. We have continuously used disinfectants, changed traps and changed various things in the hope of relieving it. When my attention was first called to this system it struck me as being different from anything we had before and it might be possibly a solution at least in part, or altogether, of the difficulty under which we had labored for so many years. Therefore I felt the more interested in it. I took pains to investigate it in other cities. I visited it at Canton, and took pains not only myself to visit it, but I invited the medical society which was present at Canton at the time—the Northern and Central Ohio Medical Association—to go down to one of the High Schools there and other schools in the city and examine into

this system. We went down and looked at this system of dry closets and this system of heating and ventilating. The system of dry closets is the only one under discussion to-night. It was the unanimous opinion of the physicians that went down there that the system was an improvement upon anything which we had had. Not only that, but I examined it in other cities—in Oberlin, in Toledo—and became thoroughly convinced in my own mind that it was a good thing. I was not satisfied then, and I asked Mr. Smead if he would be kind enough to give me a list of all the cities in Ohio in which the system was in use, and he gave me a list. I then looked over my medical directory of the United States to see if I knew a physician in the cities in which this system was in use in which I had confidence, and I made a list of the physicians in the cities in which this system was in use, and I then directed to them a personal letter, asking them their opinion of the system. With one single exception, and that in Akron, where the system had been introduced in an old building, and where they said it did not seem to work—with that single exception, I got no unfavorable answer.

It is well known that a gentleman who was connected with the board at the time, who is not now a member of the board, who was on the opposite side of the question, wrote to various parties expecting to get facts upon the *other side—upon his side—and the letters were so unanimously on the side opposite to that which he was on that he never even presented the letters here to the board.*

Now, I wrote to such men as Dr. Weaver, of Dayton; Dr. Baldwin, of Columbus; Dr. Seligman, of Defiance; Dr. Phillips, of Canton; Dr. Hubbard, of Ashtabula; Dr. Garver, of Sandusky—I cannot recall all of them. Now, all of the gentlemen to whom I wrote—Dr. Miller, of Massillon; Dr. ———, member of the Board of Health at Bellefontaine, and so on from the President of the Ohio State Board of Health, Dr. T. Clark Miller, who says, “I tell you, Doctor, that this system is a new sun in sanitary science.” From the evidence which I had I could not help believing this system was all right, and the system was introduced here, and I believe, except as far as the Central High School is concerned, not a single member is in doubt as to its efficiency and as to its value.

Now, as to some of the arguments which have been used and reasons adduced that this system should come out of the Central High School. The principal one seems to be that there is a panic in the Central High School. I will admit that, *but I tell you, gentlemen, that this panic is not altogether a true panic; it is a panic which has been influenced very largely by some things which are not altogether true.* It is well known to members of this board that the death of one gentleman has been attributed to this system. He died after having made a four weeks’ trip to Lake Superior, coming home in the middle of the vacation, *before the Smead system was introduced into the High School.* He came home and he came down town in the forenoon. I met him in the morning about 9 o’clock. He appeared to be perfectly well. I refer to Mr. Foote. He appeared to be perfectly well in the morning; he went home and ate a very hearty dinner, and before evening he was dead. Now, it has been attempted to attribute that death to this system. That was during the vacation, after a four weeks’ trip to Lake Superior, *and before the system was introduced into the High School.* That is one argument that has been used.

Another thing that has been said is that on last Tuesday morning, Dr. Thayer had taken his son out of the High School on account of the dangerous effects of the Smead system and would not allow him to go to school longer at the High School, when the fact was that on Monday, the day before this article appeared in the paper, Dr. Thayer’s son was in the High School, and on Wednesday, the day after, he was in the High School and has been there every day since, so far as I know, unless he has not been there to-day. Now, upon such evidence as this, if this be the method of argument in regard to this system, how could it be that there would not be a panic created? Now, that was not fair. I will leave it to any gentleman to say that it was fair to say that Dr. Thayer’s son was absent on account of the danger from this system, when the fact is, that the day before Tuesday he was in school, and Tuesday was a vacation day, a national holiday—of course he was

away that day—but the next day he was in school, and has been there ever since, and was not taken out on that account. Now, I have this directly from his brother; he would know; so that I know whereof I speak.

I will admit that there has been a panic worked up at the Central High School, and there are a great many honest people who believe that this is a very dangerous system. Now, I cannot agree with them, because, from my standpoint, I do not see where the danger lies. Now, if it is dangerous, then every dwelling house in the city is a dangerous thing to the neighbors, because the Cleveland Board of Health require that, connected with every water closet, there shall be a communication opening into the open air from above the building. Now, then, every man who puts a water closet into his house and makes use of this pipe to carry off the odors, etc., from the closet to the top of the house, according to this principle, is infecting his neighbors.

Now, this question of the germ theory is a pretty hard one to answer; it is a pretty hard one to discuss, because there is so much in it people do not understand. Why is it that ten men who come in contact with the discharges from typhoid fever are not affected at all by it, whereas one is? Now, it is not certainly because they do not all breathe the same germs; but for some reason they do not come in contact with the right kind of soil which causes them to develop.

Now, here, in this closet system, we have this fecal matter deposited at the bottom of the vault. In the course of a few hours it *becomes dried over and fermentation ceases*. This matter in the course of a very short time is entirely dry. Now, I will admit there *may* be odors; there must be odors in the air passing over this, going out in the stack. Nobody will deny it; but that these odors will be deleterious would be a very difficult matter to prove. Whether they are or are not would require the most careful examination by scientific men with the microscope to determine it. Now, there are scientific men who believe that a germ will only live six hours if it is dried; that after six hours, if the germ is dried, that it will not take root in the system, and will not produce disease. Others believe that the typhoid fever germ, after a certain time, will not take root, and that *it must require moisture in order to effectuate and produce its poisonous effect*. Now, why it is that in some instances the germ takes effect and in some does not, is beyond our comprehension. We do not understand that, and probably never will. If we were as susceptible to germs as some people think we are, we would all have been dead years and years ago.

By taking out the Smead system *I feel as if we were taking out the very best thing which we have got in the city for something else*. Now, I do not know but that is the best thing to do; I do not know but these gentlemen are so earnest in the matter—and I believe they are honest, because many of them are personal friends of mine, not but I have great confidence, as far as their belief and honesty is concerned. I know that these gentlemen are not trying to manufacture this feeling themselves, but they have come to believe that this is a very deleterious system, a very injurious system and do a great deal of harm; but I think they are mistaken, and I think if they study the matter carefully for day in and day out, as these members of the board have, who have been cognizant of this system from the time of its introduction here, they will sooner or later agree with us.

We know also that two years ago, in Detroit, there was a greater hurrah in regard to the Smead system than there has been in Cleveland. Mr. Smead was pictured as a thousand-headed—devil—if I have the right word, with a thousand arms reaching out and taking the school children and crushing them to death by his poisonous gases. What has been the result of that thing? It has been lived down, and not only lived down, but every school building that has been built in that city since has had the Smead system introduced into it; a medical college and hospital have adopted it. Now, if it was as bad as it was pictured to be two years ago in Detroit, what would have been the result? Last week even there were new ones put in. How was it in Columbus, in Washington? One was put in, then another and another. So it has been in Cleveland, I believe generally, except so far as the Central High School is concerned. Those people who live around the Central

High School are so opposed to it that perhaps we cannot convince them that it is best for them, *but I think the time will come when they will see their mistake.* I think if we introduce the water system they will be much more annoyed than they are at present.

And besides, in Cleveland, it is a question where all the odors come from. I have wondered myself where they come from. We have the fertilizing works, coal oil works, spent acid works, crucible steel works, all producing disagreeable odors. We cannot lay all these odors to this. I have talked with the teachers of the High School and they have told me that they have smelled this old spent acid smell in the school for the last ten or fifteen years; it was not the closets at all. I have two nieces going to the Central High School; they have only been in it since the first of February, and they both tell me that they have not once smelled, either in the basement or any other of the rooms, any smell which they could attribute to the closets. Now, there have been smells there; we will admit that, but I think these gentlemen are mistaken in charging them to the closets; and I believe that the time will come when they will see their mistake, *and when they will be glad to welcome back the Smead system in the High School. I believe if we put it out we put out the very best system which we have in the city.*

I have prepared a resolution which I will introduce and, with the consent of the chair I will read it: That further action on this subject be postponed until next Monday evening; and that this board select a committee of seven physicians who shall be asked to examine the Smead closets in the High School and report to this board at an adjourned meeting of this board, to be held next Monday evening, their findings in regard to the Smead closets, as to its working, influence upon the health of both pupils and citizens and any other questions which may seem to them important.

Now, it seems to me if we postpone the consideration of this matter until next Monday night, and then appoint a committee, it will be the best thing to do.

The Chairman: That will have to be introduced as a substitute.

Mr. Smith: I move this as a substitute for all that has gone before.

Mr. Zucker: Mr. Chairman, I rise to a point of order. It is not a substitute; it does not amend, and it groups two distinct matters together, and one is new matter.

The Chairman: The Chair rules that the motion is strictly in order and entertains the motion.

Mr. Zucker: I do not wish to take issue with the Chairman on a parliamentary question and for that reason I do not appeal, but I think if he will consider it carefully he will see that my point is correct. I am opposed to postponement; I am opposed to it for the reason I stated before. It is dallying with the measure. I insist that we take action to-night. We need no postponement. I do not care for the opinion of seven interested physicians. I haven't the least doubt if the gentlemen can get seven physicians to agree on the one side I can get seven to agree on the other. Physicians disagree. That is proverbial. That is not going to help us. We want to recognize this: "It is not a theory, but a condition that confronts us." Shall these children go on dying, this sickness go on increasing, this panic go on increasing, until the schools are closed and you demoralize your entire system. Let us give our decision to-night without postponement.

Mr. Melickar: Mr. Chairman, I move the previous question.

The motion was seconded and lost.

Dr. Smith: Mr. Chairman, it has been customary for this board for years past, wherever there were whereases that reflected upon particular individuals connected with the resolution, to strike them out; and I move those whereases be stricken out. I do not believe any member of this board wishes to do Mr. Smead an unkindness in the removal of these closets. I am sure while members of the board are in favor of taking them out of the Central High School, they are not in favor of taking them out anywhere else. I move the whereases be stricken out.

The motion was adopted.

Mr. Morris: I move the words "other than said Smead system" be stricken out of Mr. Zucker's resolution.

The motion was seconded.

The Chairman: You have heard the motion, that the words "other than said Smead system" be stricken out. Are there any remarks?

Mr. Zucker: I trust none of the members, Mr. Chairman, will allow himself to be caught in this trap. This is the whole fight over again. If we are going to denounce the Smead system let us say so. The resolution says the committee shall recommend some other system. It simply says we don't want that system. Those members who voted to strike out the whereases can now see the animus of that motion. If this motion is carried, then Mr. Smead can work with this committee to get them to bring in a favorable report. If you adopt the resolution as introduced, the committee will have no authority to consider the Smead system.

The motion by Mr. Morris was lost, and the original resolutions by Mr. Zucker were adopted.

Motion by Mr. Zucker to reconsider vote adopting his resolutions lost.

THE DRY CLOSETS IN THE CENTRAL HIGH SCHOOL BUILDING.

There has been great excitement in the neighborhood of the Central High School building, created by *sensational articles published in one of the leading daily papers of this city.*

This building was erected in 1876. Architecturally it is quite satisfactory. The recitation rooms are large and well lighted, but the ventilation of the building has always been unsatisfactory. For a number of years complaints were made of the plumbing, and foul odors were constantly finding their way into the recitation rooms from the water closets in the basement.

In 1887 the health officer, Dr. Ashmun, sent a communication to the Board of Education, stating that the Central High School building was in an unsanitary condition, and that the water closets must be removed from the building and some other system introduced. The Board of Education finally decided to introduce the "Smead" system of dry closets, which were put in the building in 1888. Soon afterwards school opened and it was found the odors were more noxious than ever. Mr. Smead was given a few days to remedy the matter or the closets were to be taken out. It was found that the old ventilating stacks, which were already in the building and were made use of, were not high enough, and that when the wind blew in certain directions it curled down over the roof, thus creating a reverse current into the building. This was soon remedied by raising the stacks twenty feet higher. *Since this time no complaints have come from the school room of bad odors,* although there has been the usual amount of headache due to imperfect ventilation.

But the troubles of Mr. Smead arose this time, not from within, but from without. In order to make this clear, it will be necessary to go back to the first introduction of the dry closets into the building. At that time a clipping from some obscure so-called health journal, published by a Seven-day Adventists' Association up in the wilds of Michigan, calling attention to the dangers of the "Smead" system of disseminating diseased germs from the top of the stacks, together with a petition objecting to the introduction of the dry closets, was industriously circulated in the neighborhood of the High School building and signed by many residents of that locality. But the Board of Education, which contains several physicians, after carefully investigating the matter, came to the conclusion that this danger was purely imaginary, and proceeded to put in the closets. *The present trouble is a continuation of the old fight.* When no further objections could be made to the sanitary condition of the closets, attacks were made upon the system as causing sickness in the community, due to the noxious gases escaping from the ventilating shaft. Reporters were in-

dustriously sent from house to house, and every case of sickness, from attacks of measles to whooping cough, was attributed to the "Smead" system. Professor Foote, who died before the system was introduced, was enumerated among the victims; and the recent death of the principal, Professor Campbell, who died of apoplexy, has proven an unanswerable argument in newspaper circles as to the dangers of the system. Indignation meetings were held and petitions presented to the Board of Education until they were finally, in deference to public opinion, compelled to order the closets out, and temporary ones were erected outside of the building.

The average attendance of pupils at the High School has been slightly higher since the introduction of the dry closets than during the previous four years. The death rate, as revealed by statistics in the health office, is considerably less in the neighborhood of the High School than the average for the entire city. The Smead system is in full operation in many other school buildings in parts of the city much more densely populated than in the neighborhood of this building; and no complaints have been made from the residents about the dissemination of noxious odors from the ventilating stacks.

Since the temporary closets have been erected, and foul odors are smelt in reality, the health office has been besieged by the same residents of this locality, and the health officer requested to call a meeting of the representative physicians of the city to investigate the matter. At the second meeting of the physicians, the following resolution was adopted, by a vote of thirteen in favor and three against the resolution:

"That the Smead dry closet system, as used in the Central High School of this city, is the best method known to us;

That a return to the water-carriage system would be to increase, rather than lessen, the dangers of disease-breeding in the building and neighborhood;

The improved ventilation of the Central High School building is imperatively demanded and would, in our opinion, remove most if not all the cause for complaint."

From a scientific standpoint, the following objections have been urged against the system: First, The possibility of back draughts. Second, The possibility of disseminating diseased germs from the top of the stack. Third, The improper ventilation of the building during the summer months, when the furnace is not in operation, and the doors and windows open. If any of these objections are proven to be valid by scientific experiments and investigations, the system could very easily be modified to meet all requirements. The following suggestions are offered as modifications which might be made, and thus forestall all criticisms:

First, as to back draughts, which under ordinary conditions are impossible, they could be remedied very easily by a system of automatic valves, thus making such currents impossible. Second, as to the possibility of the dissemination of diseased germs from the top of the stack, our present knowledge of the subject of bacteriology would lead us to believe improbable, yet this could be remedied by causing the air to pass through actual fire instead of over it as now, thus effectually destroying all germs. Third, as demonstrated at the meeting of the physicians in the Waring School building, it seems that during the summer months, when the doors and windows are open, there may be a reverse current of air from one room to another, and it seemed to be the impression of many of those present that it would be an improvement in the ventilating system to have each room connected separately with the foul air gathering room.—*From Cleveland Medical Gazette.*

